

Elementary Go Series, Vol. 4

LIFE AND DEATH

by

James Davies

Second Edition

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PREFACE TO THE SECOND EDITION

When I started to play the game of go in the United States, books of life-and-death problems were not available, so I studied the subject on my own by attempting systematically to analyze some of the shapes that kept appearing on the board. This was a time-consuming project. In some cases it took years to reach the right answer. In a few cases, equal time was spent in reaching the wrong answer. Right or wrong, the answers went into the first edition of this book, which, by emphasizing the status of standard groups, has apparently helped many players to win games. The second edition takes the same approach as the first edition and largely contains the same material, but corrects the mistakes that have been pointed out over the years.

A number of people have contributed to this book in various ways. It is a pleasure to acknowledge the assistance of the following:

1) Stuart Dowsey, who, before he left Japan, put together a collection of life-and-death problems into which I dipped two or three times;

2) James Kerwin, who took time to read the final draft of the first edition and was responsible for a number of corrections and improvements;

3) my wife Toshiko, who cut and pasted into the manuscript all of the eight hundred twenty-two diagrams;

4) Mark Boon, Richard Hunter, Pierre Colmez, and others who pointed out various errors that remained in the first edition.

Yokohama, Japan
August 1, 1996

James Davies

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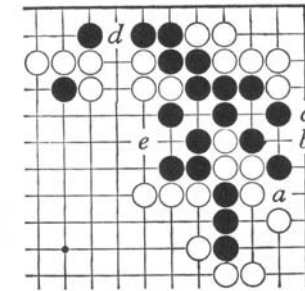
INTRODUCTION

This book covers the basics of life and death, that is, of eye shape. Everyone who has gone through the maddening experience of having his groups slaughtered right and left by some stronger player in a high-handicap game knows the importance of this subject. Serious life-and-death problems may arise only a few times in the course of the average game, but when they do arise, they deserve to be read out carefully. Mistakes made in them tend to be more costly than any other kind of mistake.

What is the issue in a life-and-death situation? Most life-and-death problems in books seem to be presented in the following manner: Black to play and kill White; or White to play and live; or Black to play and live in ko; etc. This format has the advantage that even without looking at the answer, you usually know when you have solved the problem. Unfortunately, however, during a game there is no one standing at your elbow to tell you that this group can be killed, or that one can be saved in ko, etc.

What you have to do during actual play is to work out the status of each group that comes into question. If a group is alive as it stands, you have to know that, so you will not make an unneeded move "saving" it. Similarly, you do not want to waste a move making an already dead group deader. Nor do you want to try to kill a live enemy group, unless you are losing and desperate, since that tends only to reinforce it and remove whatever potential you had for making threats against it. On the other hand, if an enemy group is not yet dead, but can be killed, or if a friendly group is not yet alive, but can be saved, you have to know this, and to know the sequence that kills or saves it.

There are two types of status that a group may have: settled and unsettled. A settled group is one that is dead or alive as it stands; one that, accordingly, neither player should want to touch. Here are two examples.

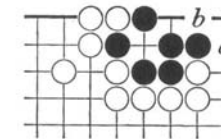


Dia. 1

Dia. 1. Black is alive.

Black has one eye on the right edge: if White plays *a*, Black can answer at *b*, and if White plays *b*, Black can play *a* in sente, then play *c*. For his second eye Black can play either *d* or *e*, so that even if White takes one of these two points, Black can take the other.

Since Black's status is settled, White should be in no hurry to play *a*, *e*, etc., but should save them for possible use as ko threats. Black, for his part, should not try to play *a* too early, since in the first place he loses some of what potential remains in his three dead stones if White answers, and in the second place White might ignore Black *a* to make a big play elsewhere.



Dia. 2

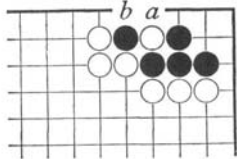
Dia. 2. Black is dead.

If Black plays *a*, White replies at *b*, and vice versa. Again, Black should not play *a* or *b* just to make White respond. He should save the situation for use as a ko threat.

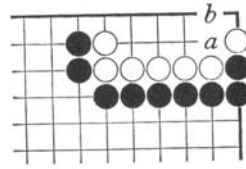
If a group's status is unsettled, then it lives or dies depending on who makes the next move. For example:

Dia. 3. Black can live. White can kill.

If Black goes first, he will play *a*, capture the white stone, and be alive, but if White goes first, he will capture with *b* and Black will be dead. In other words, this group lives or dies according to sente.



Dia. 3



Dia. 4

When a group's status is unsettled, a ko may be involved, as in *Dia. 4*.

Dia. 4. White can live. Black can make a ko.

If White goes first he can live unconditionally by playing *a* or *b*. If Black goes first, however, he will attack at *a*, White will answer at *b*, and there will be a ko fight. One could also say that in this position White is alive in ko, although whether he is really going to live or not depends on how many ko threats he has elsewhere on the board.

This book is organized into sections, each section describing one basic shape or technique and containing several problems. Many of the problems are status problems: you are given a group and asked to determine its status. Answering these problems means finding the group's status and reading out the sequences that back up your finding.

I was almost inclined to make all of the problems status problems, but for various reasons I did not; in some cases I felt that the problem was too hard for status treatment, and in other cases the context made status treatment inappropriate. Accordingly, there are lots of problems of the familiar Black-to-kill or White-to-live variety. Each group of problems is followed by answers on the succeeding two pages, but you will get more out

of this book if you solve the problems on your own.

The problems range widely in difficulty, from the extremely easy to the rather hard. This reflects the fact that the life-and-death situations one meets in actual play range widely in difficulty. I have tried to make the problems as realistic as possible.

When a ko is involved, the situation can become rather complicated because there are different kinds of ko. In *Dia. 4* the ko was direct — either side could win it by ignoring just one enemy ko threat — but there are also indirect kos, in which one or both sides have to make extra approach moves. The following are the three main types of indirect ko.

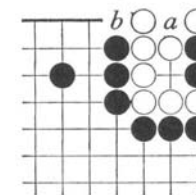
Dia. 5. Multi-step ko (favorable to White)

For White this is a direct ko, but for Black it is a two-step one. After taking the ko at *a* and ignoring a ko threat, Black has to make an approach move at *b*. Finally, to win the ko fight, he will have to ignore a second ko threat.

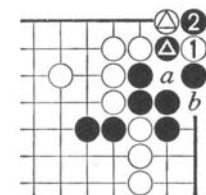
One can also imagine three-step kos, four-step kos, and so on.

Dia. 6. Two-stage ko (favorable to Black)

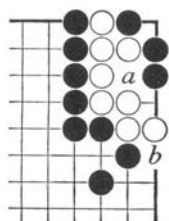
White 1 starts a two-stage ko. While the ko is being fought at 1 and 2, it is direct for Black, (all he has to do is to capture the marked white stone), and indirect for White, (he has to play *a* and then *b* to win it). If White ignores a ko threat, however, the ko will move over and be fought at the marked black stone and *a*, and in that stage it will be direct for White and indirect for Black.



Dia. 5



Dia. 6



Dia. 7

Dia. 7. Thousand-year ko.

A thousand-year ko is marked by the presence of an internal approach move, like *a*, that could be made by either side. There may also be, as in this case, outside liberties. Here the ko is a two-step one for White, who has to make the approach move at *a*, and a three-step one for Black, who has to make approach moves at *a* and *b*. What often happens is that neither player makes the approach move at *a*, each waiting for the other to do so, and in the end Black connects to make a seki. White will have to be sure to maintain an adequate supply of ko threats as the game draws to a close, however.

Taking all this into consideration, one can imagine groups with statuses like the following:

Black can live. White can make a favorable two-stage ko.

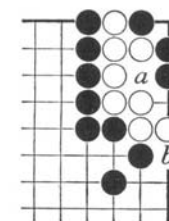
or

Black can make an unfavorable two-step ko. White can kill.

A few of the problems in the later chapters of this book will involve indirect kos.

Before we begin, here are some words about ground rules and terminology.

In *Dia. 8* on the next page we have a situation where Black is able to live by playing 1, threatening to link up to his three



Dia. 7

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Taking all this into consideration, one can imagine groups with statuses like the following:

Black can live. White can make a favorable two-stage ko.

or

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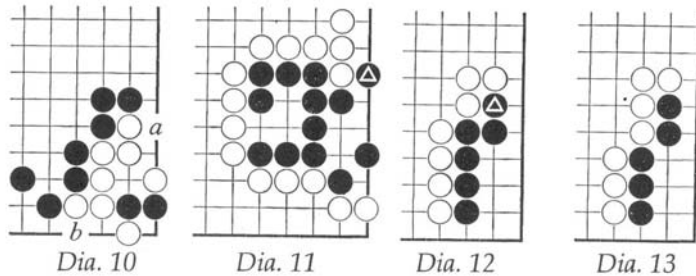
In *Dia. 8* on the next page we have a situation where Black is able to live by playing 1, threatening to link up to his three

Finally, here are three technical terms that will appear in this book. The first two are Japanese.

1. **Miai.** Two points are *miai* if they represent two independent ways of accomplishing the same thing, so that if deprived of one of them, you can fall back on the other. In *Dia. 10* *a* and *b* are *miai* for White's second eye, so he is alive.

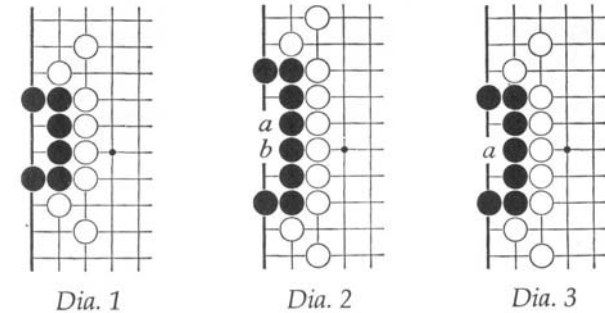
2. **Hane.** A *hane* is a move that bends around an opposing stone without touching any friendly stones. The marked black stone in *Dia. 11* is an example at the edge of the board. According to a well-known saying, there is death in the *hane*, but sometimes there is also life or *ko* in the *hane*. Because of the *hane* in *Dia. 11*, the black group cannot be killed unconditionally. Compare the white group in section 14, problem 5.

3. **Leg.** The black group in *Dia. 12* has a leg: the marked stone. If the supporting stone at the three-five point were white, as in *Dia. 13*, the leg would be a weak leg, and the group's status would change from alive to unsettled.



1. UNSETTLED THREE

When a group's eye shape consists of a line, (straight or bent), of unoccupied spaces, three is the critical length. Anything shorter is dead. Anything longer is alive. Three in a row is unsettled.



Dia. 1. Two spaces: Black is dead.

Dia. 2. Four spaces: Black is alive. If White attacks at *a*, Black can make two eyes by playing *b*, or vice versa.

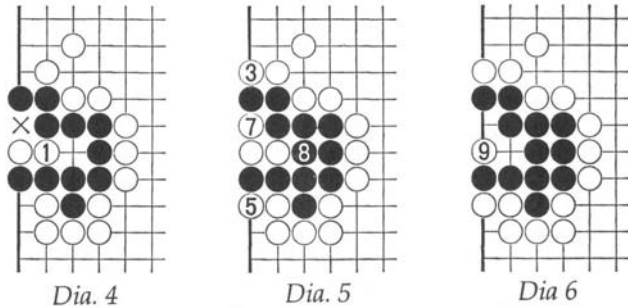
Dia. 3. Three spaces: the unsettled case. If Black plays *a*, he is alive, but if White plays *a*, Black is dead. These facts are proven in any beginners' book, such as *The Magic of Go* by Cho Chikun or *Go for Beginners* by Iwamoto Kaoru.

Three in a row is the first of the five basic unsettled shapes. If you do not know what the other four are, you will find them in the pages ahead. Right now we shall use the unsettled three to examine one of the basic techniques for killing enemy groups.

Suppose a group's eye space is almost filled by some invading stones. 'Almost' here means 'with just one space left open.' Suppose further that the invading stones form an unsettled shape. When the group's outside liberties are gone, it will be in *atari*, so the invading stones will have to be captured, but the

shape they leave behind will be unsettled, and it will be the opponent's turn. By playing back into the unsettled shape, he can kill the group.

This process of forcing the enemy to capture an unsettled shape does not have to be carried through to completion to kill the group, as the following example shows.

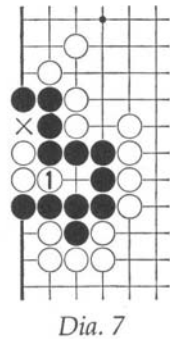


Dia. 4. When White plays 1, Black is dead, and no further moves are necessary. Black cannot stop White from in theory playing x and almost filling his eye space with an unsettled three.

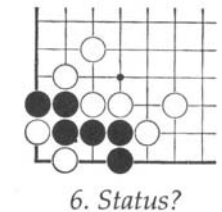
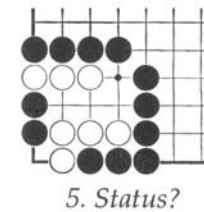
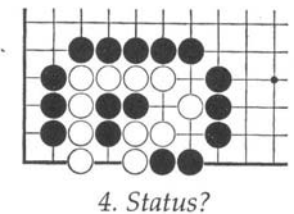
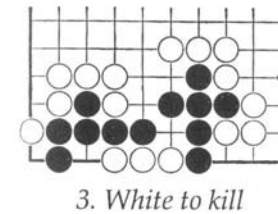
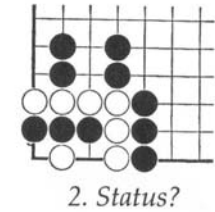
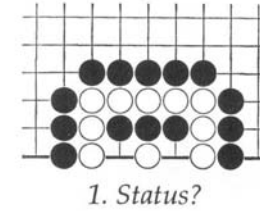
Dia. 5. This shows how Black can be put into atari. He captures the invading stones with 8, but —

Dia. 6. White plays back into the unsettled three and kills him.

Dia. 7. To kill, the unsettled shape must almost fill the enemy's eye space. Here, for example, White 1 is not a killing move, although it does create a seki. Black has two internal liberties left, and if White ever adds a stone at x to give atari, it will be a live four, not an unsettled three, that Black captures.



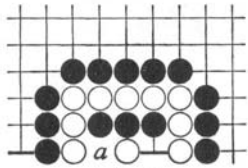
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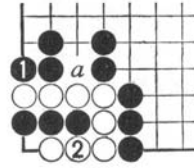
Answers

1. White is alive in seki.

Dia. 1. White cannot capture Black, for if he plays *a*, he will be dead. Black cannot capture White, for if Black plays *a*, White will capture four in a row and be alive with territory.



Dia. 1



Dia. 2

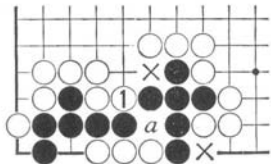
2. White is dead.

Dia. 2. This looks like the same shape as before, but now if Black plays 1 and *a*, White will be in atari. Nor does it help White to answer 1 with 2, since his eye space is then almost filled by an unsettled three.

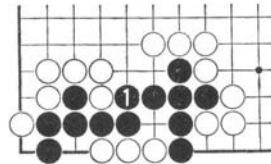
3. Creating a cutting point.

Dia. 3a. White 1 starts to break the connection between the two halves of Black's group. If White later fills liberties at the points marked *x*, the right side of Black's group will be in atari, and he will have to connect at *a*. But then he will be dead.

Dia. 3b. If Black plays 1, he is alive in seki.



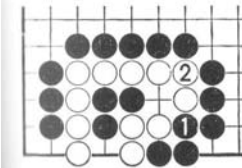
Dia. 3a



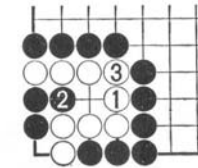
Dia. 3b

4. White is alive.

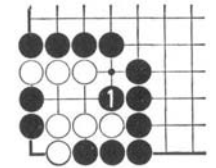
Dia. 4. If Black plays 1, White answers at 2, and vice versa. Since each half of the white group touches both of the internal liberties, White is alive.



Dia. 4



Dia. 5a



Dia. 5b

5. White can live. Black can kill.

Dia. 5a. White lives with 1 and 3, in seki of course.

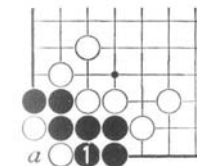
Dia. 5b. Black 1 kills White. Other moves would kill him, too, but 1 does the job best, leaving White not even any ko threats.

6. White can kill. Black can live.

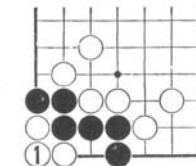
Dia. 6a. Black 1 guarantees two eyes after capturing at *a*.

Dia. 6b. White's connection kills Black.

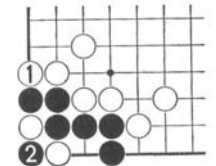
Dia. 6c. This is a mistake. There is no reason for White to let Black have a ko.



Dia. 6a



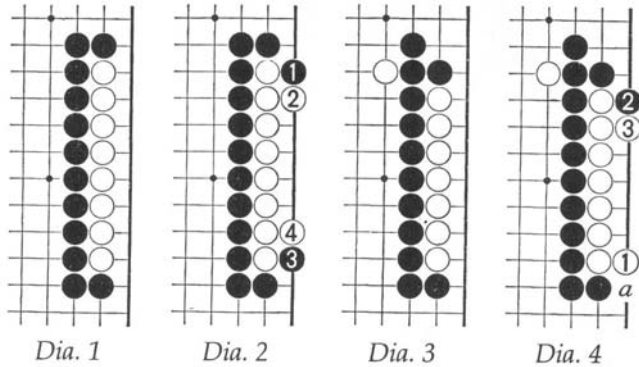
Dia. 6b



Dia. 6c

2. SIX DIE, EIGHT LIVE

The groups in this section consist of rows of stones on the second line. Their eye space, then, consists of a row of points on the first line, the exact length of the row being undetermined. When the group is away from the corner, the rule is six die, eight live.



Dia. 1. Here is one such group. Being eight stones long, it is alive.

Dia. 2. In this type of position, all that Black can try to do is to shorten White's eye space by pushing in with hanes like 1 and 3, but after 2 and 4, White has the living shape of four in a row.

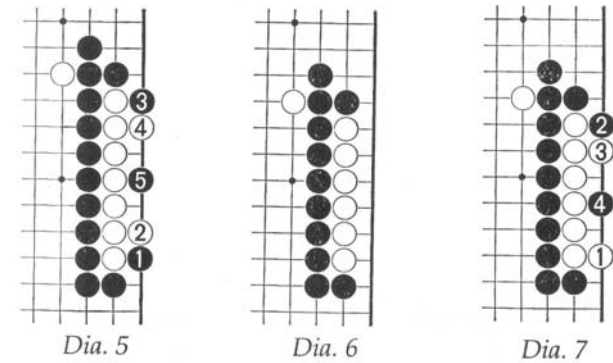
Dia. 3. Seven stones long is the unsettled case.

Dia. 4. If White plays first, he can live. He has several ways of doing so, but 1 is the best, since next he can push down the side at *a*.

Dia. 5. (next page) If Black plays first he can kill White.

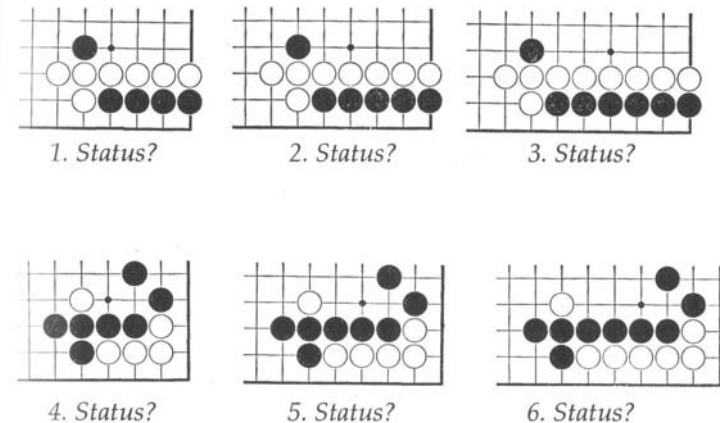
Dia. 6. This group is six stones long and is dead.

Dia. 7. White cannot make enough room to live.



When the group is in the corner, the rule is different and is left for you to discover in the following problems.

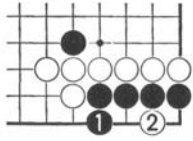
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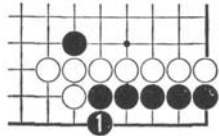
Answers

1. Black is dead.

Dia. 1. Black 1 is answered by White 2.



Dia. 1

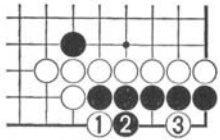


Dia. 2a

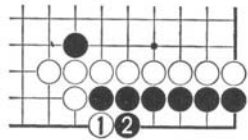
2. Black can live. White can kill.

Dia. 2a. Black 1 makes the living shape of four in a row.

Dia. 2b. If White plays first, he can shorten Black's eye space with 1 and kill him.



Dia. 2b



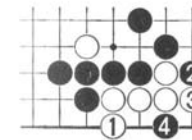
Dia. 3

3. Black is alive.

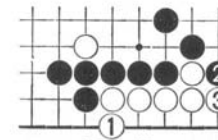
Dia. 3. Even if White shortens Black's eye space with the 1-2 exchange, there is enough left to make Black alive. The rule in the corner, then, is that four die and six live.

4. White is dead.

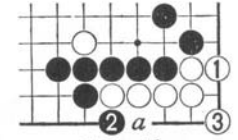
Dia. 4. White goes first, but Black shortens his eye space with 2 and kills him with 4. If White played 1 at 2, Black would answer with 2 at 1.



Dia. 4



Dia. 5a



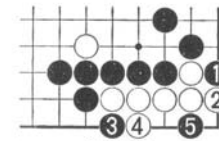
Dia. 5b

5. White can live. Black can kill.

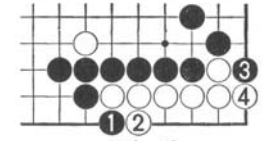
Dia. 5a. White 1 is the best way to live. The 2-3 exchange may as well be left unplayed.

Dia. 5b. This White 1 also works, but it is inferior. If Black plays 2, White must answer at 3, not *a*, and that makes his territory a point or two smaller than in *Dia. 5a*. White 3 at *a* would make a bent four in the corner and risk a ko — see page 73.

Dia. 5c. If Black plays first, White dies.



Dia. 5c



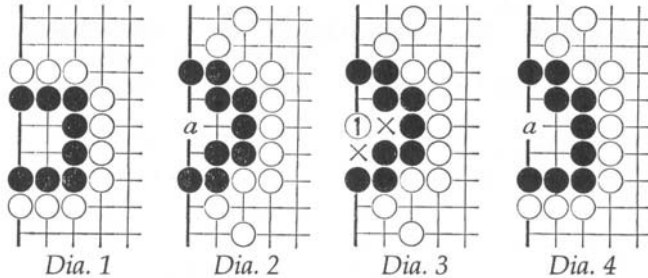
Dia. 6

6. White is alive.

Dia. 6. Black cannot keep White from getting four in a row. In the last three problems the line went around the corner instead of stopping in it, but the rule remains the same: four die, six live. There are a couple of other shapes of five and six that go around the corner, but they obey this rule too.

3. FOUR- AND FIVE-SPACE EYES

Eye shapes consisting of four or more spaces in a row are alive, but when the spaces are not in a row, the shape may be unsettled, or even, in one case, dead.



Dia. 1. This is the dead shape, the square four. Black cannot stop White from almost filling his eye space with an unsettled three. If he takes one of the internal points, White will take the diagonally opposite point.

Dia. 2. This four-space pyramid is an unsettled shape. If Black plays *a*, he is alive with three eyes.

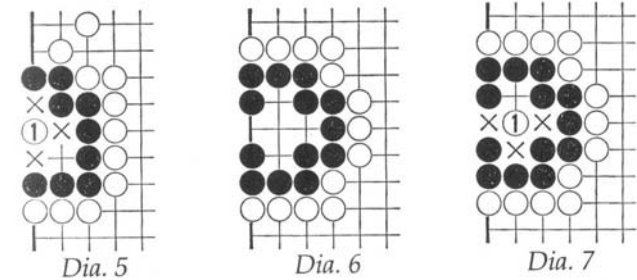
Dia. 3. But if White plays 1, he can almost fill Black's eye space with an unsettled three (by playing on the points marked *x* for example), so Black is dead.

Dia. 4. This bulky five shape is also unsettled. If Black plays *a*, he is alive.

Dia. 5. (next page) But if White plays 1, he can almost fill Black's eye space with a four-stone pyramid, (or a square four), so Black is dead.

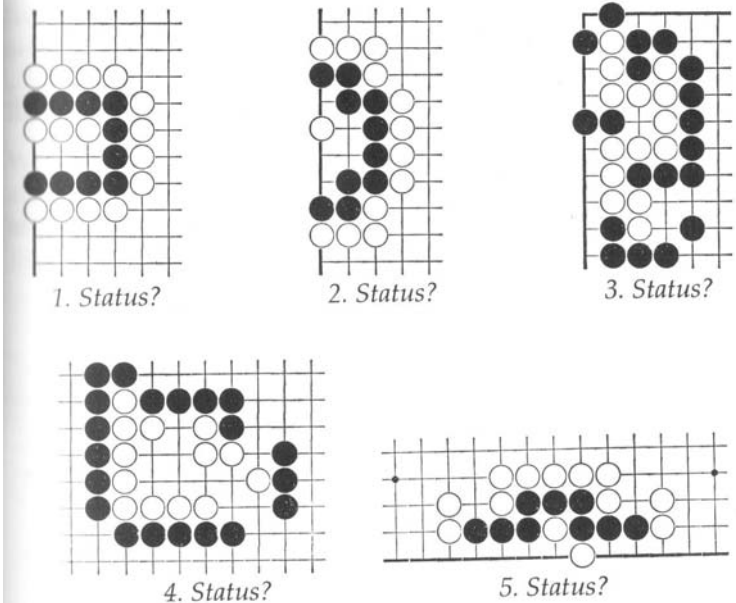
Dia. 6. This five-space star shape is in the same unsettled state. If Black occupies the center point, he is alive with four eyes.

Dia. 7. But if White plays there, he can almost fill Black's eye space with a four-stone pyramid, so Black is dead.

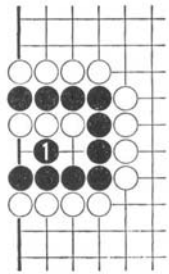


There are two other shapes of five spaces that are not in a row, but they are both alive. See if you can find them and verify this.

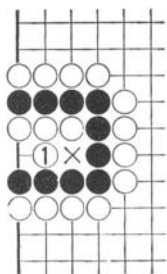
Problems



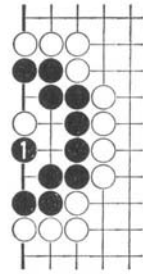
Answers



Dia. 1a



Dia. 1b



Dia. 2a

1. Black can live in seki. White can kill.

Dia. 1a. Black 1 takes the key point and creates a seki.

Dia. 1b. White 1 is the killing move. Next White can almost fill Black's eye space with an unsettled bulky five, (by playing x, although of course he need not actually do so).

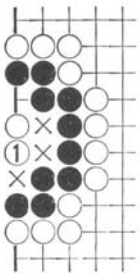
2. Black can live. White can kill.

Dia. 2a. Black lives with six points of territory.

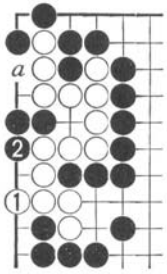
Dia. 2b. White 1 is fatal, since White can then almost fill Black's eye space with a bulky five.

3. White can live. Black can kill.

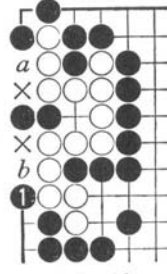
Dia. 3a. White 1 threatens 2, but if Black plays 2, all he gets is a seki in gote. It does Black no good to play a.



Dia. 2b

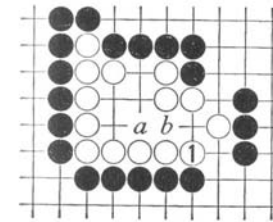


Dia. 3a

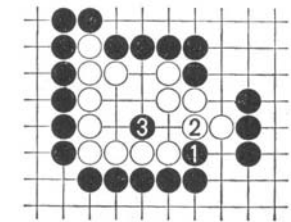


Dia. 3b

Dia. 3b. When Black takes the key point with 1, White is dead. Even if White is allowed to play a and b, Black can almost fill his eye space with a four-stone pyramid.



Dia. 4a



Dia. 4b

4. White can live. Black can kill.

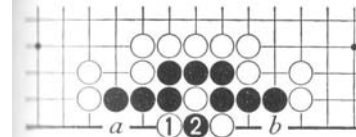
Dia. 4a. White 1 makes a and b miai, so Black cannot prevent the formation of two eyes.

Dia. 4b. Black begins by exchanging 1 for 2, creating a bulky five shape; then kills it with 3. If Black began at 3, White could answer at 1 and live.

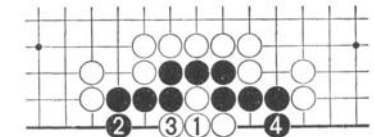
5. Black can live. White can make a ko.

Dia. 5a. It is obvious that Black can live, so let's see how White can make a ko. He must start with 1. When Black captures at 2, the ko is on. If Black plays a, White will play b, or vice versa, to keep him from reaching a seki. If White connects the ko, Black's eye space will be almost filled by a four-stone pyramid.

Dia. 5b. A mistake; Black lives in seki.



Dia. 5a

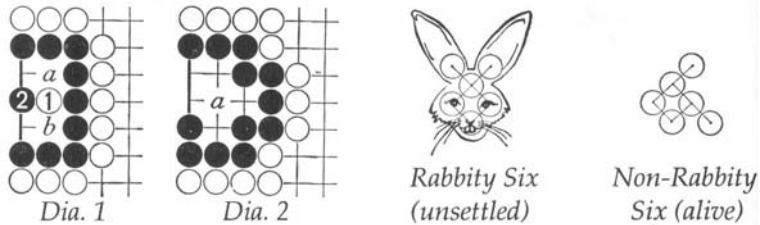


Dia. 5b

4. RABBITY SIX

Barring the existence of cutting points or a shortage of liberties, almost all six-space shapes are alive.

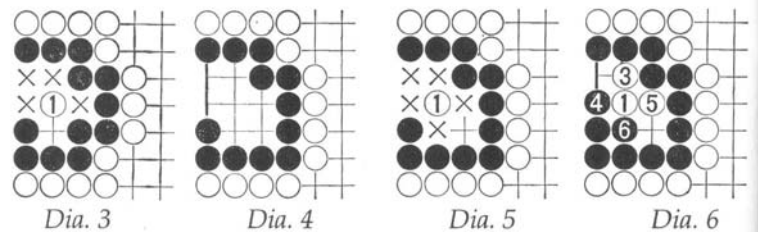
Dia. 1. In the rectangular six, for example, if White attacks at 1, Black defends at 2, making *a* and *b* miai. Or if White attacks at 2, Black defends at 1.



Dia. 2. The one exception to the rule that six are alive is this rabbit six shape, which is unsettled. The drawing illustrates the etymology of the name. (In Japanese this shape is called *hana-roku*: flower-six.) The key point in *Dia. 2* is *a*, and if Black plays there, he lives.

Dia. 3. But if White plays 1, he can almost fill Black's rabbit six with a bulky five, so Black is dead.

There are twelve essentially different non-rabbit shapes of six, including the rectangular six, and you might like to discover them and verify that they are alive.



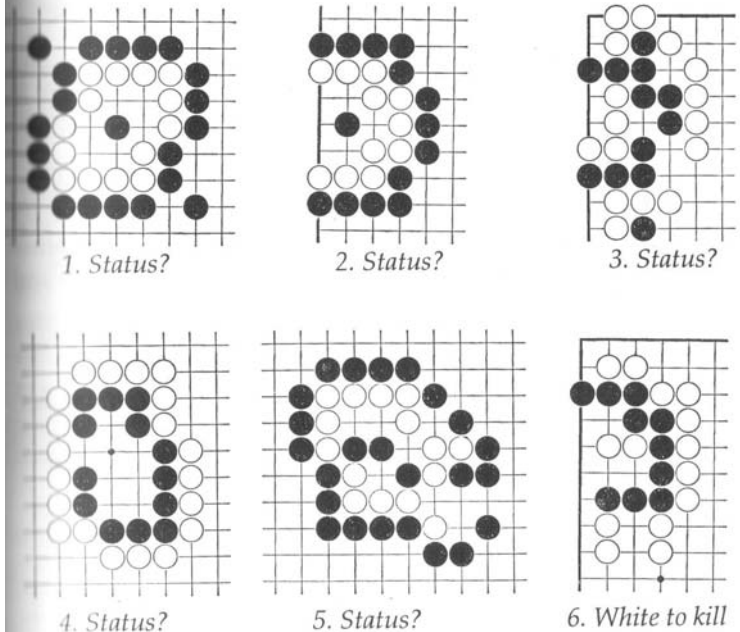
Again barring cutting points etc., shapes of seven spaces or more are always alive.

Dia. 4. If any shape of seven could be killed, it would be this one.

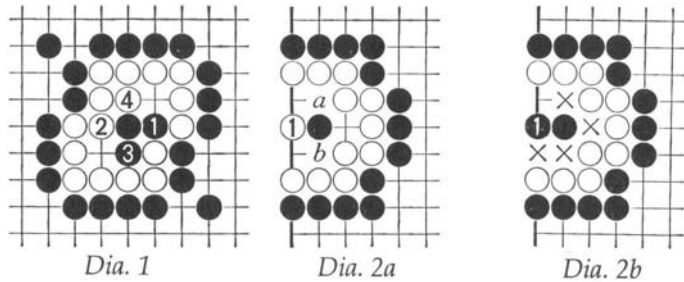
Dia. 5. Attacking at 1, White seems to be threatening to almost fill Black's eye space with a rabbit six.

Dia. 6. But when White starts filling with 3 and 5, Black answers at 4 and 6, and gets a seki. White 3 and Black 4 are miai, as are White 5 and Black 6.

Problems



Answers



1. White is alive in seki.

Dia. 1. If Black cuts at 1, White must connect at 2; Black then has to play 3 to stop the eye, and White makes a seki with 4.

2. White can live. Black can kill.

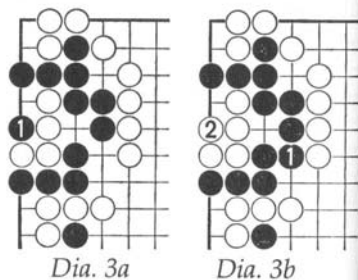
Dia. 2a. White 1 makes *a* and *b* miai.

Dia. 2b. If Black plays 1, he can almost fill White's shape with a rabbit six, and White has no defense.

3. Black can live. White can kill.

Dia. 3a. Black 1 takes the key point in this problem. When Black starts to lose his outside liberties, he can survive by capturing four in a row. If White captures 1, Black will recapture five in a row. If White has sente, he will play at 1 in *Dia. 3a* and Black will be dead.

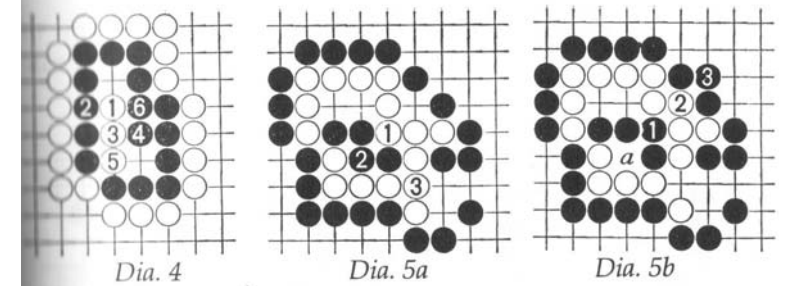
Dia. 3b. This Black 1 is a mistake. White 2 takes the key point, and now Black's eye space is destined to be almost filled by a rabbit six.



4. Black is alive (White has a sente seki).

Dia. 4. White 1 is the only point at which to start an at-

tack, but if Black defends correctly, the result is a seki. White 3 at 4 also produces a seki.



5. White can live. Black can kill.

Dia. 5a. White 1 is the key point. After 3, White is alive.

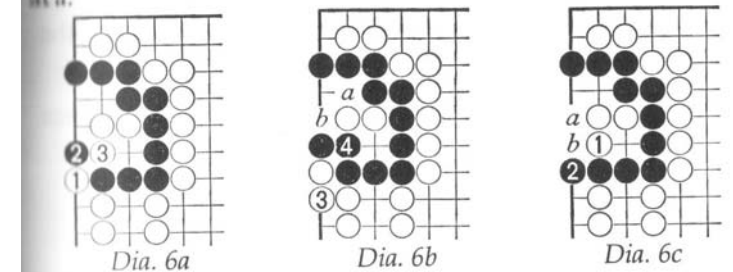
Dia. 5b. Black 1 is fatal. White can exchange 2 for 3, but he cannot take *a*, the point he needs, due to a shortage of liberties.

6. Hane

Dia. 6a. White 1 and 3 are correct. Even if Black captures 1, White can almost fill his eye space with a rabbit six.

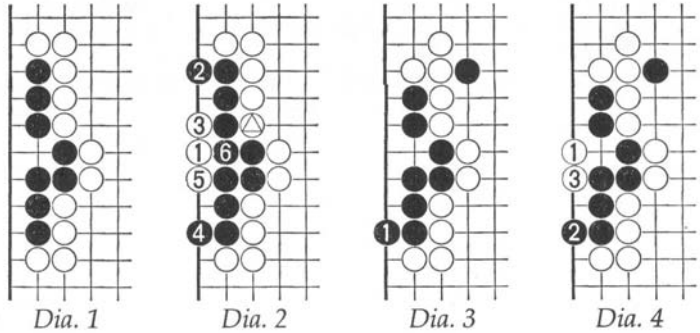
Dia. 6b. White must not connect at 3, or Black will connect too and be alive, (*a* and *b* are miai).

Dia. 6c. If White lets Black play 2, Black's eye space becomes too large to be killed. White can continue with *a* and form a rabbit six, but Black will have two internal liberties left and be safe. White 3 at *b* is an interesting idea, but Black can answer it at *a*.



5. ONE-SPACE NOTCHERS

The groups in this section may all be described as a row of stones on the second line with a notch in it. The general rule here is four die, seven live, and five and six are unsettled.



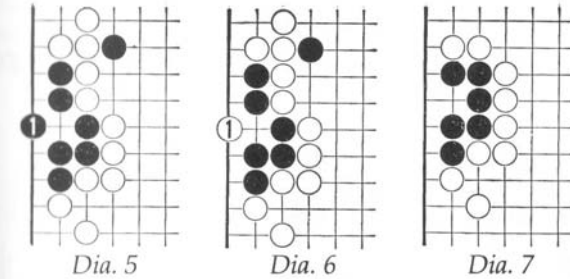
Dia. 1. This black group measures seven lines from end to end, and is alive. If the notch were located a line higher or lower, instead of right in the middle as shown, the group would still be alive.

Dia. 2. If White attacks, then 1 is the only place for him to start. Black, however, lives in seki with 2 and 4.

White can play this sequence in sente, (the marked white stone forces Black 6), but before doing so, he should make sure that Black 2 and 4 are not going to have too bad an effect on the situation on the outside.

Dia. 3. Now Black's group is only six lines long, and he has to add a stone to it in order to live. Black 1 is best.

Dia. 4. If it is White's turn, then Black dies.



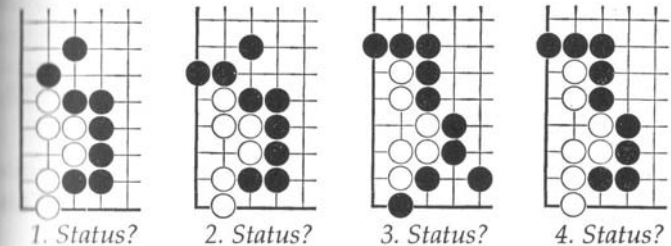
Dia. 5. Five lines long is the same as six lines long. If it is Black's turn, he can live with 1.

Dia 6. But if it is White's turn, Black dies.

Dia 7. And if the black group is only four lines long, then of course it is dead from the start.

When these shapes occur in the corner, their statuses are different: see problem 1, for example.

Problems

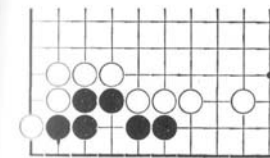


1. Status?

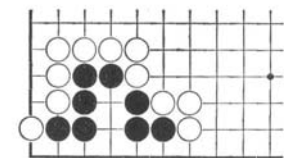
2. Status?

3. Status?

4. Status?



5. Status?

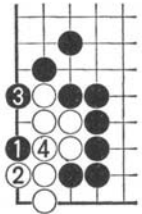


6. Status?

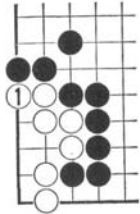
Answers

1. White is alive.

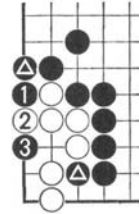
Dia. 1. Five lines long is long enough to live in the corner. Against Black 1, White plays 2.



Dia. 1



Dia. 2a



Dia. 2b

2. White can live. Black can kill.

Dia. 2a. If it is White's turn, then 1 gives him five points of territory.

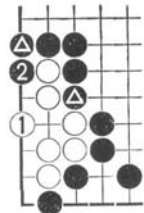
Dia. 2b. But if it is Black's turn, then 1, backed up by the marked stones, becomes a killing move. (1 at 3 works, too.) If one of the black marked stones were missing, White could live by playing 2 at 3.

3. White is dead.

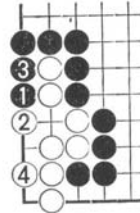
Dia. 3. Once again, the marked black stones are the killers.

4. White is alive.

Dia. 4. Black has a tesuji at 1, but it falls short of killing White. After 4, if Black captures the two stones he has in atari, White will recapture.



Dia. 3

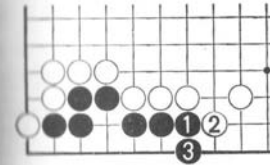


Dia. 4

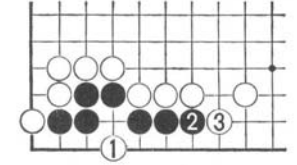
5. Black can live. White can kill.

Dia. 5a. The best way for Black to live is to push forward at 1, then play 3.

Dia. 5b. If it is White's turn, then 1 kills Black.



Dia. 5a

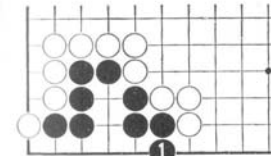


Dia. 5b

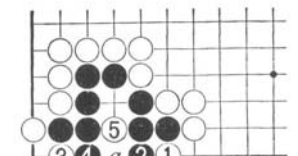
6. Black can live. White can kill.

Dia. 6a. Black has several ways to live, but this is the best.

Dia. 6b. White 1, (or 3), is the killing move; hane is often murderous. White must avoid the pitfall of attacking at the center of symmetry in this shape. If he plays 1 at 5, Black answers at *a* and lives, or if he plays 1 at *a*, Black answers at 5 and lives.



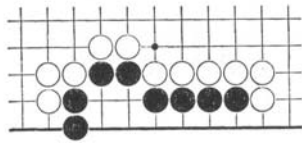
Dia. 6a



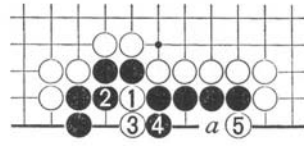
Dia. 6b

6. SHORTAGE OF LIBERTIES

Liberties are sometimes more important than shape in questions of life and death. Frequently a group lives or dies only because one side cannot make some connection, or occupy some crucial point, owing to a shortage of liberties. This section samples a few of the techniques that make use of a shortage of liberties.



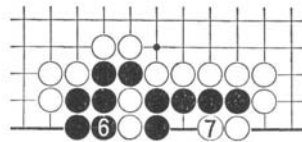
Dia. 1



Dia. 2

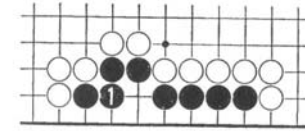
Dia. 1. Black seems to have plenty of room for two eyes in this position. Indeed, he would be alive if only he had an extra liberty somewhere, but he does not, and White can kill him.

Dia. 2. White begins with 1 and 3. These plays threaten to capture the five stones to the left, so Black answers them at 2 and 4. Now there is enough room to the right of Black 4 for a second eye, but unfortunately there is also a shortage of liberties, so when White hanes at 5, Black cannot play *a*.



Dia. 3

Dia. 3. Black can get his liberties back by capturing with 6, but then White 7 takes away his second eye.

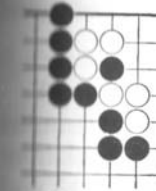


Dia. 4

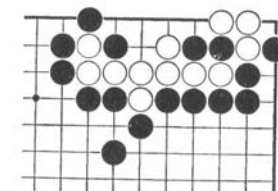
Dia. 4. Well, Black had only himself to blame for his death in *Dias. 1* to *3*. If he had made a solid connection as shown here, or a diagonal connection, he would have been alive. His position in this diagram is a one-notcher seven lines long, a standard live shape.

Shortage of liberties is something that comes in many shapes and forms, so no two of the following problems are like each other, or like the preceding example.

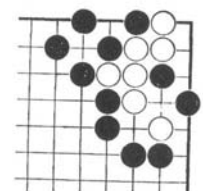
Problems



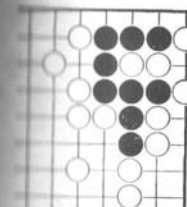
1. Black to kill



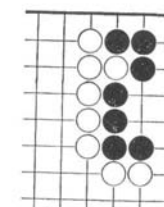
2. Status?



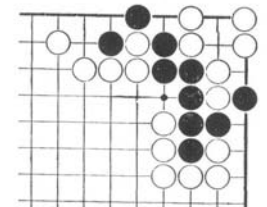
3. White to live



4. Black to live

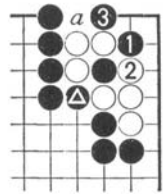


5. White to kill

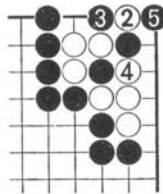


6. Black to live

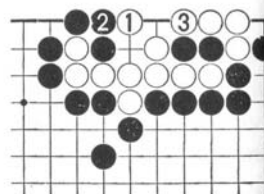
Answers



Dia. 1a



Dia. 1b



Dia. 2a

1. Hane

Dia. 1a. Black begins with the hane at 1, the eye-stealing tesuji in relation to marked black stone. If White captures at 2, Black hanes again at 3, and White cannot play *a*.

Dia. 1b. White may play 2 here, but he cannot capture Black 3, (snap-back), and the result is essentially the same as before.

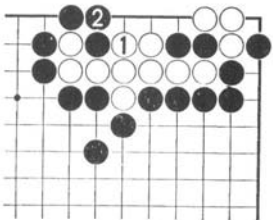
2. White can live. Black can kill.

Dia. 2a. White lives by playing 1 and 3. If Black went first, he could kill White by playing 1 himself.

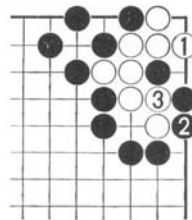
Dia. 2b. If White played 1 here, he would bring a shortage of liberties down upon himself and die.

3. Descent

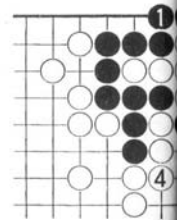
Dia. 3. White should descend to 2, making one eye in the corner and setting up a shortage of liberties to stop Black from escaping with 2. If White plays 1 at 3, Black answers at 1 and White has a ko on his hands.



Dia. 2b



Dia. 3



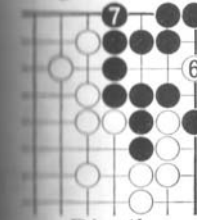
Dia. 4a

4. Patience

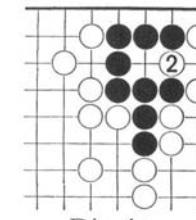
Dia. 4a. Black must patiently descend to 1. If White connects at 2, Black 3 captures five stones due to a shortage of liberties.

Dia. 4b. White 6 is answered by Black 7.

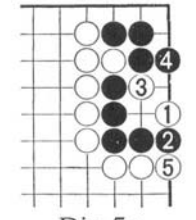
It would be a grave mistake for Black to capture with 1 at 2 in *Dia. 4a*. White would recapture (*Dia. 4c*), freeing himself of his shortage of liberties, and Black would be dead.



Dia. 4a



Dia. 4b



Dia. 4c

5. Eye-stealing tesuji

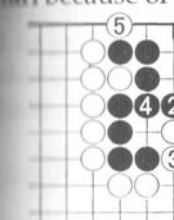
Dia. 5a. White 1, the eye-stealing tesuji, takes advantage of Black's shortage of liberties.

Dia. 5b. If Black plays 2 here, White 3 threatens a snap-back, and White 5 is the finishing blow.

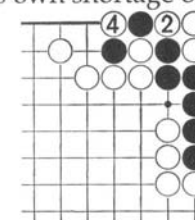
6. Capture

Dia. 6a. To live, Black has to capture some enemy stones. This he can do only with 1, 3, and 5, causing a shortage of liberties in his favor.

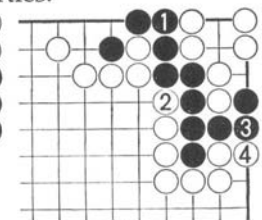
Dia. 6b. If Black tries to capture too much by playing 1, the shoe will be on the other foot. After White 4, Black cannot give atari because of his own shortage of liberties.



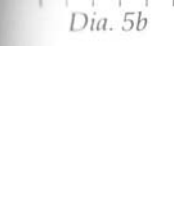
Dia. 5a



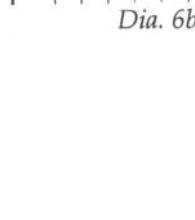
Dia. 5b



Dia. 6a



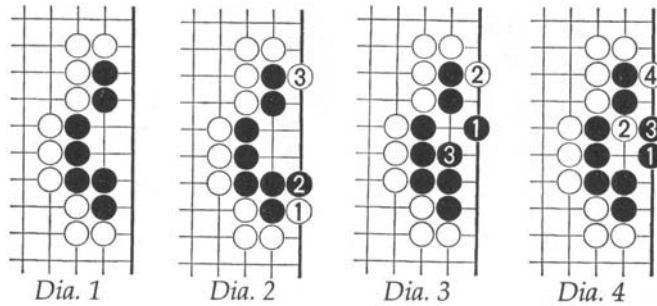
Dia. 6b



Dia. 6c

7. TWO-SPACE NOTCHERS

We are still studying notched rows of stones on the second line, but now the notches are two spaces long.



Dia. 1. This formation is a good one to remember as a point of reference. As it stands, it lives or dies according to sente. If it were one line longer, it would be alive, and if it were one line shorter, it would be dead.

Dia. 2. If it is White's turn, he can kill Black by reducing his eye space with 1 and 3.

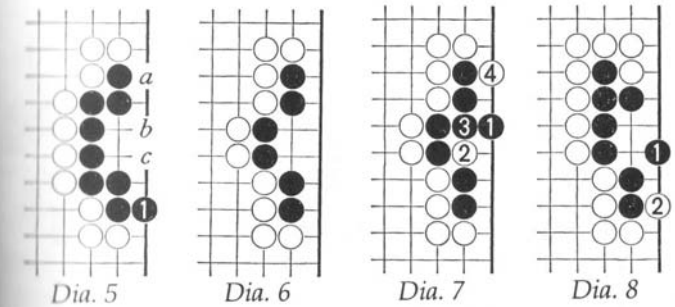
Dia. 3. And if it is Black's turn, he can live by playing 1. Black 1, guarding the cutting point, is the only move that works.

Dia. 4. If Black plays 1 here, for example, missing the right defense by one point, White can kill him with 2 and 4.

Dia. 5. (next page) When Black has no cutting points in his shape, he can afford the luxury of living by descending to 1. This way is desirable, since it may have an effect on the outside. Next, if White plays *a*, Black plays *b*, or if White plays *b*, Black plays *c*.

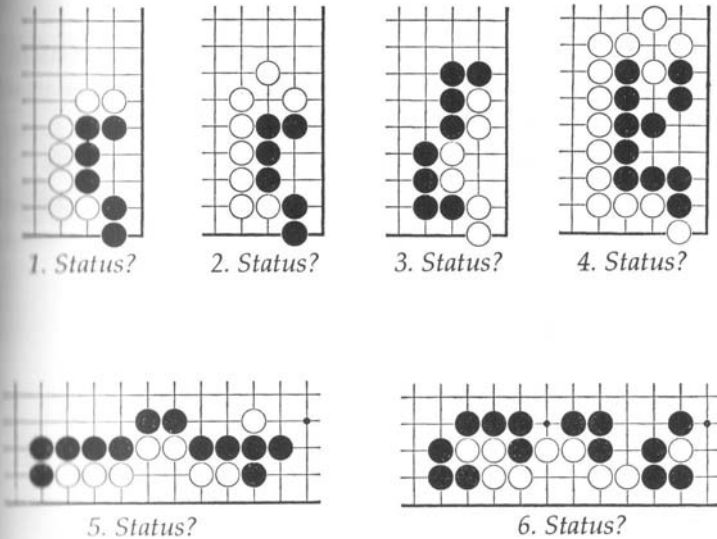
Dia. 6. Here Black has two cutting points, and as you may deduce from *Dia. 4*, he is dead.

Dia. 7. Black tries to live with 1, but White 2 kills him.

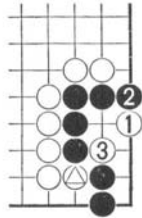


Dia. 8. This group is too short to be able to live on the side. If Black plays 1, White plays 2, for example. The way it behaves in the corner, however, is very interesting, and is left for you to work out in problems 1 and 2 below.

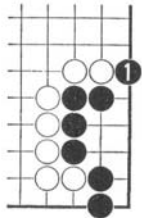
Problems



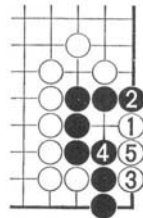
Answers



Dia. 1a



Dia. 1b



Dia. 2

1. Black can live. White can kill.

Dia. 1a. White plays first. White 1 works with the marked stone to catch Black in a shortage of liberties.

Dia. 1b. Black plays first. Black 1 prevents the sequence of the previous diagram.

2. Black is alive (White has a gote seki).

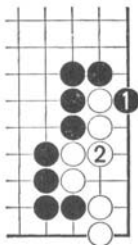
Dia. 2. The sequence of Dia. 1a would no longer work. The best that White can do is to make a seki in gote as shown.

3. White is alive.

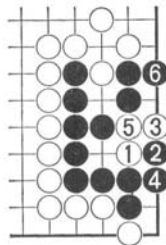
Dia. 3. The 1-2 exchange creates the live shape of problem 1 in the previous section. 1 is Black's best move; any other attack would only lead to White's getting more territory.

4. Black is alive (White has a sente seki).

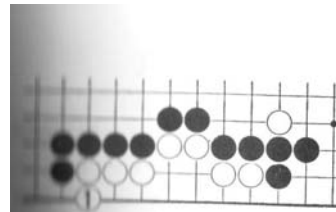
Dia. 4. White 1 is the only attack worth looking at, but Black 2 defeats it.



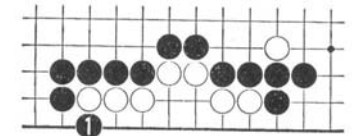
Dia. 3



Dia. 4



Dia. 5a



Dia. 5b

5. White can live. Black can kill.

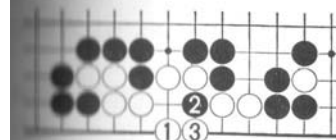
Dia. 5a. This shape is one stone longer than a dead shape, and, as you might guess, it lives or dies according to sente. If White has sente, 1 is the best way for him to live.

Dia. 5b. If Black has sente, then 1 reduces White to a dead shape.

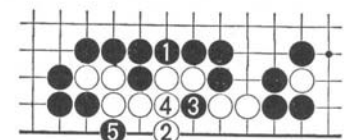
6. White can live. Black can kill.

Dia. 6a. White has enough outside liberties that he can just live by playing 1.

Dia. 6b. Given sente, Black can kill White and simultaneously perfect his outer wall with 1. White 2 no longer works.



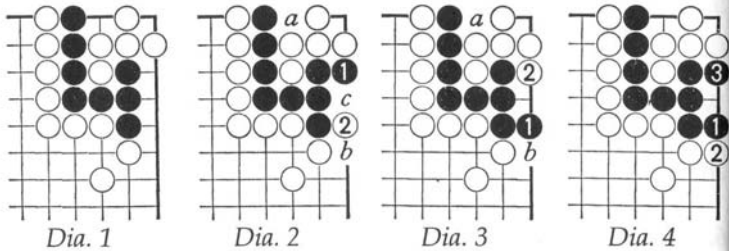
Dia. 6a



Dia. 6b

8. AN EYE IN THE INTERIOR

When the attacker has built a one-eyed group for himself inside the group he is attacking — in its stomach, so to speak — that may mean that he has killed it. There are two separate types of this situation.



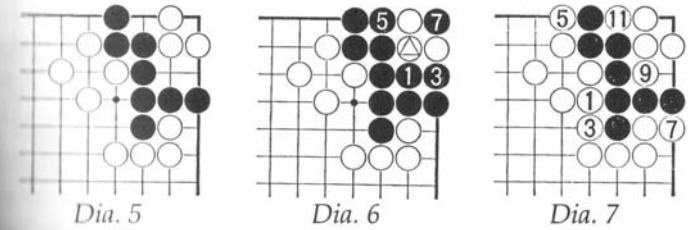
Dia. 1. Here is an example of the first type. If Black could capture the five white invaders, he would have a living shape, but —

Dia. 2. If he plays 1, White answers at 2 and Black cannot continue at *a*. The five white stones are protected by their eye and by Black's shortage of liberties. Black is unprotected; White can play *b* and *c* and put him into atari.

Dia. 3. If Black plays 1 here, White answers at 2 and the situation remains unchanged. Black does not have enough outside liberties to put White into atari. White, however, need only play *a* and *b* to put Black into atari.

Dia. 4. White must not answer Black 1 this way, or Black will make an eye with 3 and gain a *seki*.

Dia. 5. (next page) Here is an example of the second type of situation. Black now has enough outside liberties to capture the invading white stones, but it does him no good because they have an unsettled-three shape. Nor can he make an eye to match White's, so he is dead.

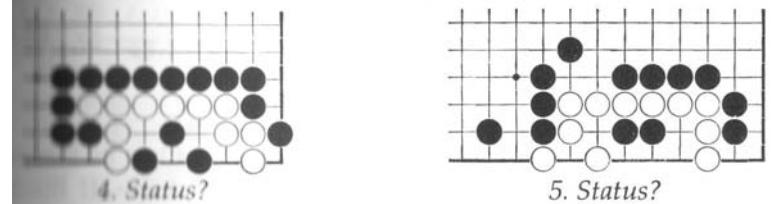
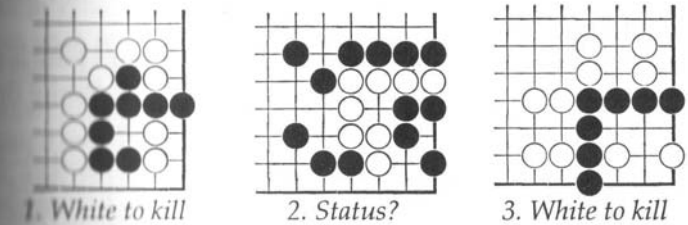


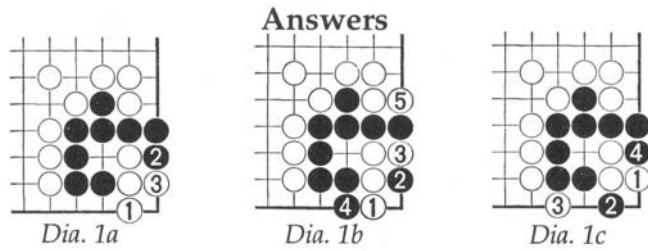
2, 4, and 6: elsewhere;
8: at the marked stone

Dia. 6. Black 1 to 7 are futile.

Dia. 7. Since Black has no resources, all he can do is to await White 1 to 11 and death. White need not play all the moves in his diagram, of course; they just go to prove that Black can be put into atari.

Problems





Answers

1. Unsettled pyramid

Dia. 1a. White 1 is the killing move. If Black answers at 2, White 3 makes the unsettled pyramid shape.

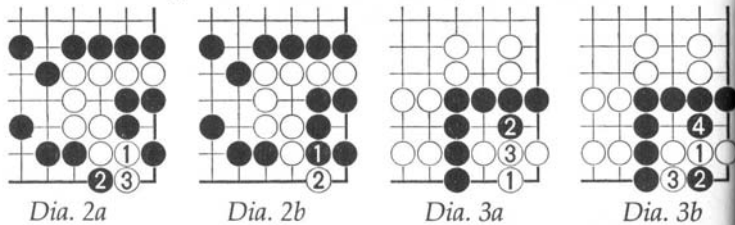
Dia. 1b. If Black plays 2 here to keep White from reaching the pyramid shape, White makes his eye with 3 and Black is dead on a shortage of liberties. If he had one more outside liberty, he could live this way, but unfortunately —

Dia. 1c. This White 1 is a mistake. Black 2 makes 3 and 4 miai, and Black lives.

2. White can live. Black can kill.

Dia. 2a. By making Black's eye a false one, White can live in seki. (If White had one less outside liberty, Black could play 2 at 3 and force a ko).

Dia. 2b. Black has several ways to kill White, but 1 here is the strongest, since Black can afford to ignore White 2. White does not have enough outside liberties to capture Black.



3. Unsettled pyramid

Dia. 3a. White 1 is the key point. Black 2 is only a ko threat, since White 3 creates the unsettled pyramid shape. If Black

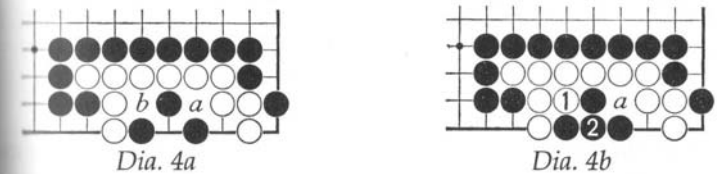
played 2 at 3, White would capture it and have the unsettled star shape in Black's interior.

Dia. 3b. White 1 here is a mistake. Black can stop the pyramid shape with 2, and has enough outside liberties to capture White if he plays 3. If White plays 3 on the outside, Black 3 makes the position a seki.

4. White is dead.

Dia. 4a. If White does nothing, Black can fill all his outside liberties, then put him into atari with *a* and *b*.

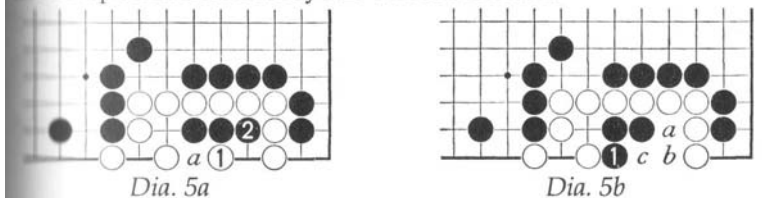
Dia. 4b. But if White plays 1, (or *a*), Black can almost fill his eye space with a bulky five. Either way, White is dead.



5. White can live. Black can kill.

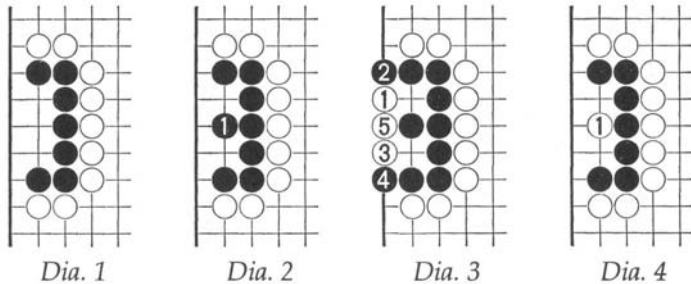
Dia. 5a. If White plays 1, all that Black can do is to make a seki in gote with 2. If he plays 2 at *a*, White answers at 2 and lives with territory.

Dia. 5b. To kill White, Black plays 1, starting to form an eye. He can fill White's outside liberties, then complete the eye with *a* and *b* to put White into atari. If White plays *a*, Black answers at *c*, and can then almost fill White's eye space with a bulky five. If Black played 1 at *c*, however, White would ignore him, and he could neither almost fill White's eye space with any unsettled shape nor make an eye in White's interior.



9. THREE-SPACE NOTCHERS

The groups in this section are three-space notchers.



Dia. 1. This is the simplest pattern — all notch and no legs. Black lives or dies according to sente.

Dia. 2. This is how Black can live. Black 1 tends to be the key point in most three-notcher formations, a fact that will help you to solve four of the six problems in this section. Black 1 is the only way to live in this particular case.

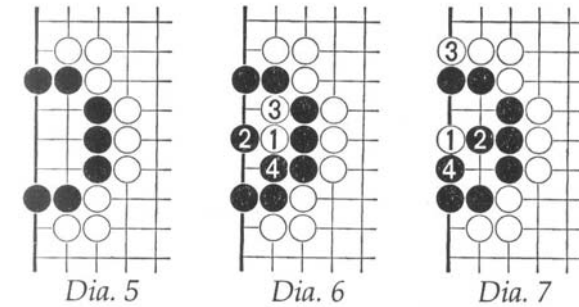
Dia. 3. If White attacks after the last diagram, all he can get is a gote seki.

Dia. 4. White to play, and although there are many ways he can kill Black, White 1 on the key point does the job most effectively.

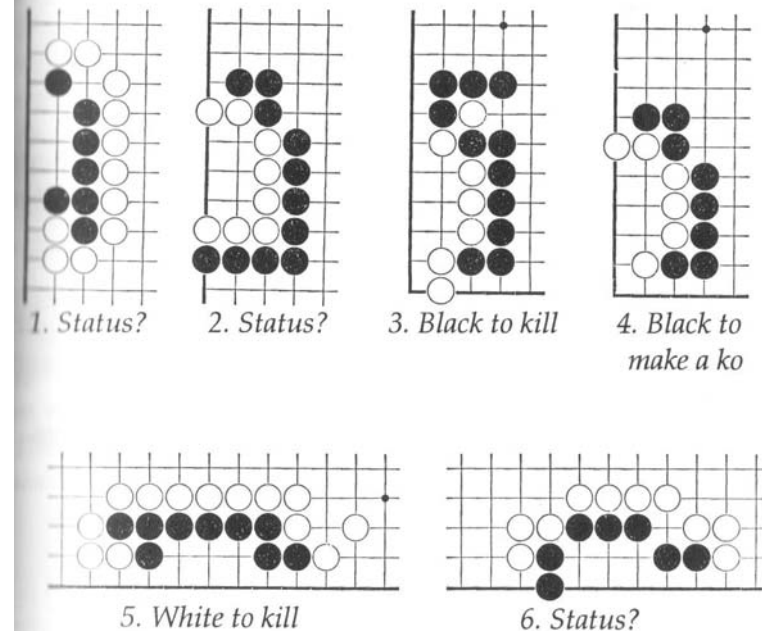
Dia. 5. (next page) This pattern, called the comb formation, is another good one to know. Black is alive.

Dia. 6. White 1 on the key point is answered by Black 2 underneath, and then White 3 and Black 4 are miai. Black has lived.

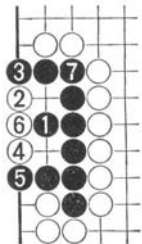
Dia. 7. This White attack ends in much the same way as the last one. The comb formation is alive.



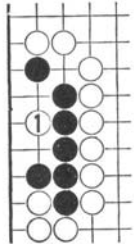
Problems



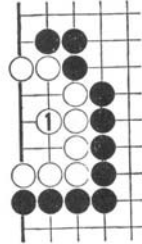
Answers



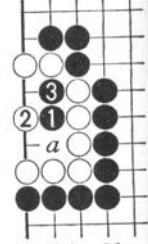
Dia. 1a



Dia. 1b



Dia. 2a



Dia. 2b

1. Black can live. White can kill.

Dia. 1a. Black 1 takes the key point. White can make a seki in sente with 2 to 6, but that is not necessarily good for him, since Black 3 and 7 affect the outside.

Dia. 1b. White 1 is, of course, fatal.

2. White can live. Black can kill.

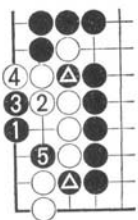
Dia. 2a. White lives with five points of territory.

Dia. 2b. Black 1 at the key point finds White short of liberties. White needs to play 4 at *a*, but that would put his own stones into atari.

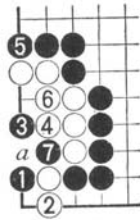
3. The eye-stealing tesuji.

Dia. 3. Black 1 is the eye-stealing tesuji in relation to both of the marked stones, and 3 and 5 catch White in a shortage of liberties.

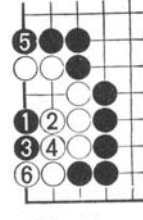
If Black played 1 at 4, White would play 1 and be alive.



Dia. 3



Dia. 4a

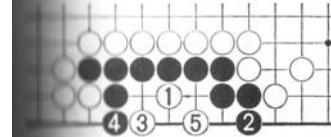


Dia. 4b

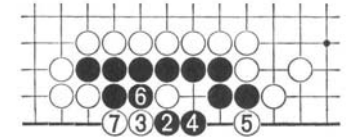
4. The clamping tesuji

Dia. 4a. Black's clamping tesuji at 1 forces the ko. White may play 2 at *a*, in which case Black 3 at 2 again makes a ko. Black 1 at 2 would let White have the live comb formation.

Dia. 4b. Here the eye-stealing tesuji fails.



Dia. 5a



Dia. 5b

5. An eye in the interior

Dia. 5a. White attacks at the familiar key point. Black's strongest defense is at 2, but White can form an eye in his interior with 3 and 5. The order of 1 and 3 may be reversed.

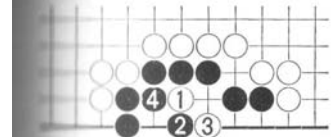
Dia. 5b. A variation. If Black captures 3 and 7, White will replay at 7 to make the eye false.

This problem shows that a three-space notcher with one leg has the same status as a three-space notcher with no leg.

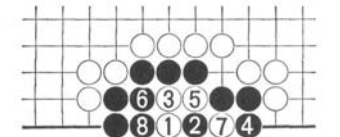
6. Black can live. White can make a ko.

Dia. 6a. If Black goes first, he can live by playing at 1 in this diagram. If White goes first, he must attack at 1 and 3, and Black must reply with 2 and 4. This type of ko occurs rather often.

Dia. 6b. If White attacks from this point, there is no ko. Black squeezes him with 6 and 8 and lives unconditionally.



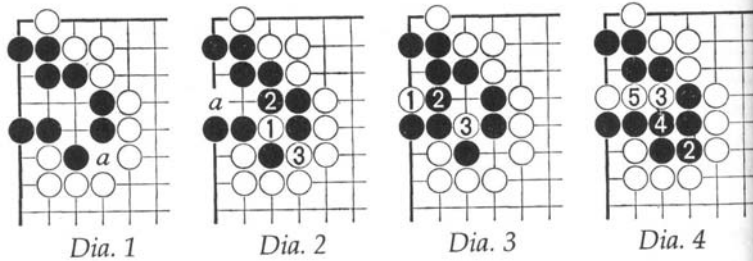
Dia. 6a



Dia. 6b

10. FALSE EYES AND PLACEMENT TECHNIQUES

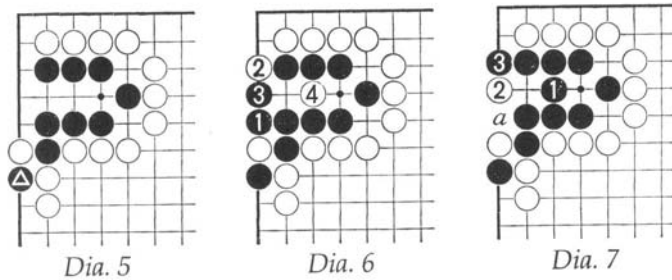
Dia. 1. At first glance, this Black group seems to be alive; if White gives atari at *a*, Black will connect and have four spaces in a row. There is, however, a subtle way for White to kill Black.



Dia. 2. White's trick is the throw-in at 1. Black cannot connect at 3 because of a shortage of liberties, so he must capture at 2 and White 3 creates a false eye. Unfortunately, Black can then live by playing *a*. White must be even more subtle than this.

Dia. 3. White has to start with the placement attack at 1. If Black answers with 2, then White can use his throw-in at 3 to ruin Black's second eye.

Dia. 4. If Black plays 2 this way, White kills him with 3 and 5.

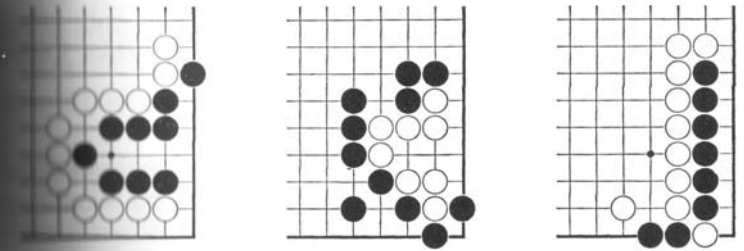


Dia. 5. The same type of technique can be used in reverse to live. Black can save himself in this position if he finds the right way to make use of the marked stone.

Dia. 6. This Black 1 does no good. Capturing one stone makes only a false eye, and White destroys Black with 2 and 4.

Dia. 7. The proper method is to play Black 1 here and draw White in to 2. After 3, if White connects at *a*, Black will capture three stones, and that will be worth a real eye.

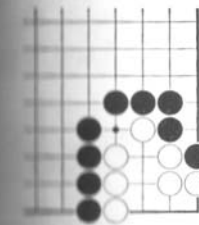
Problems



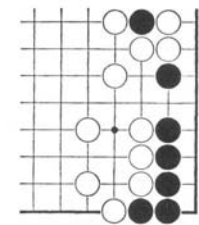
1. Status?

2. White to live

3. White to kill

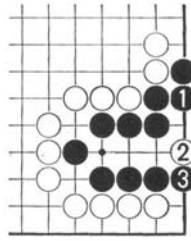


4. Black to kill

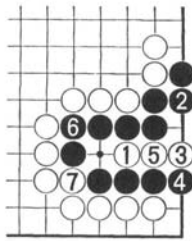


5. White to kill

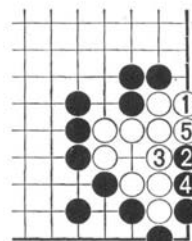
Answers



Dia. 1a



Dia. 1b



Dia. 2

1. Black can live. White can kill.

Dia. 1a. Perhaps 1 is Black's best way to live.

Dia. 1b. The placement attack at 1 is White's only killing move. Black can almost force a seki with 2, but White 7 splits his group apart and he dies.

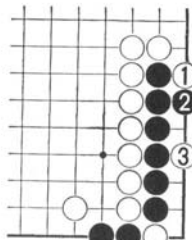
2. Capturing three

Dia. 2. White 1 threatens 2, so Black plays there, but White 3 makes one eye, and after 4 and 5, White can get his second eye by capturing three stones.

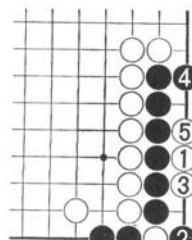
3. Proper timing

Dia. 3a. This problem calls for proper timing. White must start with the hane at 1. If Black blocks at 2, then the placement attack at 3 kills him.

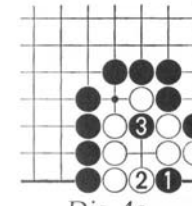
Dia. 3b. If White starts with the placement attack, Black can reach a seki with 2 and 4, which threaten Black 3 and 5, respectively.



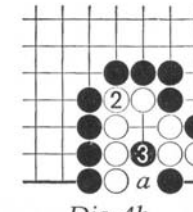
Dia. 3a



Dia. 3b



Dia. 4a



Dia. 4b

4. Shortage of liberties

Dia. 4a. Black 1 forces White into a shortage of liberties. If White answers at 2, the throw-in at 3 makes the eye there false.

Dia. 4b. White 2 here is answered by Black 3, and White cannot play *a*, again because of a shortage of liberties.

5. Placement and wedge

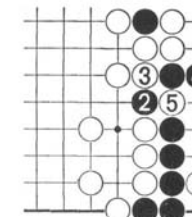
Dia. 5a. This problem is quite difficult. White must start at 1. If Black tries to widen his eye space with 2, White wedges in at 3. Black must play 4, but then White 5 forces a false eye. Black 6 and White 7 are miai.

Dia. 5b. This Black 2 runs into the same problem. If Black played 2 at 5, White would answer at 4 and Black's eye space would not be long enough for life.

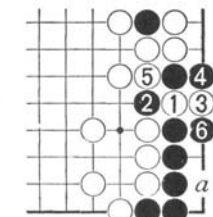
Dia. 5c. White cannot begin by wedging; after Black 6, the points 1 and *a* are miai, and Black lives.



Dia. 5a



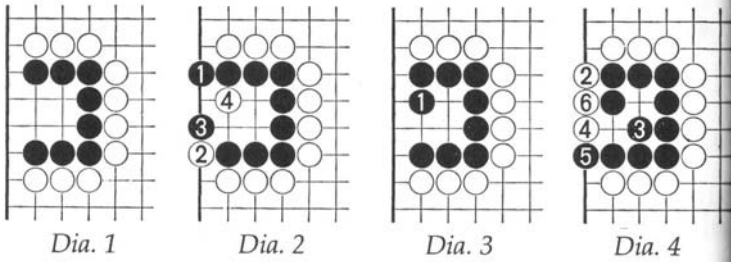
Dia. 5b



Dia. 5c

11. THE DOOR GROUP IS DEAD

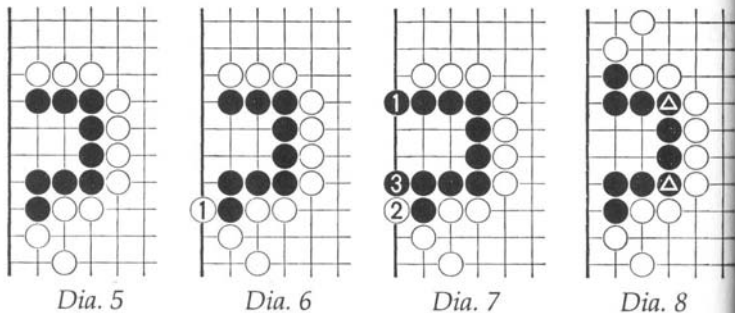
Dia. 1. This is the door group, and unless Black has threats to escape that he can make use of, he is dead.



Dia. 2. If Black descends to 1, White pushes in with 2 to make the bulky five shape, then kills it with 4. White 2 is, by the way, the only killing move.

Dia. 3. Black's strongest attempt to live is this move, but even it fails, as the next diagram shows.

Dia. 4. White 2 is the correct counter-move (once again, it is unique), and Black 3 produces only one eye. This sequence, even though it fails here for Black, is the key to several of the problems on the next page.



Dia. 5. When the door group is augmented by a leg on one side, it lives or dies according to sente.

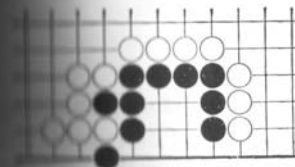
Dia. 6. White to play: White 1, reducing the position to *Dia. 1*, is the (unique) killing move.

Dia. 7. Black to play: he can live by descending to 1 or, if he likes, by descending to 2, as you may verify.

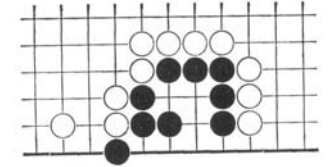
Dia. 8. With legs on both sides, the door group is alive.

The door group is strongly affected (favorably) by the presence of hanes, and (unfavorably) by the absence of the marked stones in *Dia. 8*. The problems explore these matters.

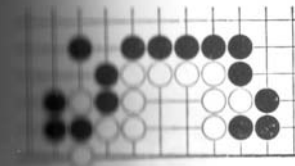
Problems



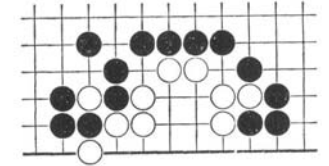
1. Black to live



2. White to kill



3. Status?



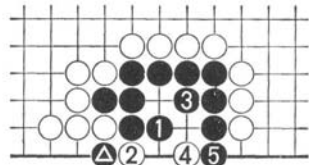
4. Black to kill

Answers

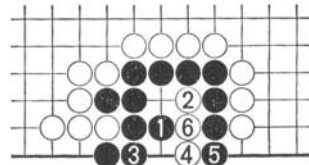
1. Turn in from the hane.

Dia. 1a. Black 1, turning in from the hane at the marked stone, is the right move. After the sequence to 5, White cannot connect.

Dia. 1b. If White attacks this way he can get a gote seki, but Black still lives.



Dia. 1a

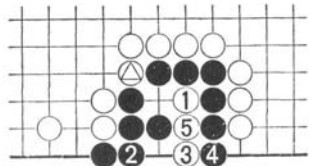


Dia. 1b

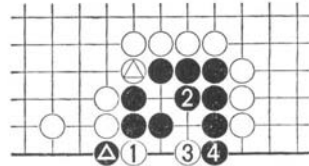
2. Placement attack

Dia. 2a. The marked white stone makes White 1 a killing attack.

Dia. 2b. White must not start with 1 here, or he will be caught in a shortage of liberties. On the other hand, if the marked white stone were black and the marked black stone were not in place, then this White 1 would work and *Dia. 2a* would fail.



Dia. 2a

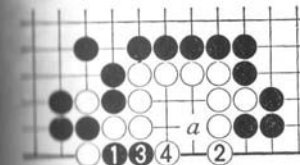


Dia. 2b

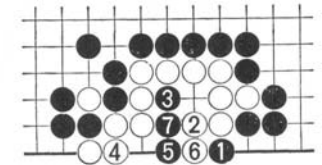
3. White is alive.

Dia. 3a. If Black attacks at 1, White has several possible replies, among which 2 is the most direct. Black cannot continue his attack with 3 because White 4 captures him, leaving the points 1 and *a* as miai.

Dia. 3b. If Black attacks from this side with 1, he can get a gote seki.



Dia. 3a

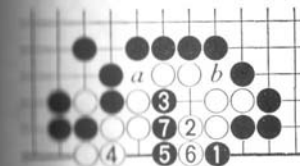


Dia. 3b

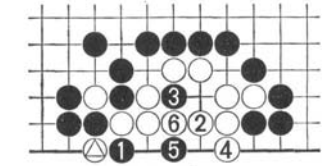
4. Hane

Dia. 4a. Black 1 is the move. White 2 is the strongest defense — if White had a stone at *a* or *b* it would produce a seki — but after Black 7, *a* and *b* are miai and White is dead. If White played 2 at 6, Black could play 3 at 2 or 7.

Dia. 4b. This Black 1 turns out to fail. By playing 2 and 4, White can draw Black into a shortage of liberties, thanks to the marked white stone.



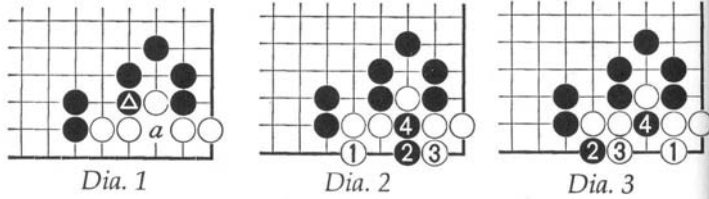
Dia. 4a



Dia. 4b

12. INCOMPLETE SHAPES

Having studied a large number of standard formations, we shall now take a look at what happens to some of them when crucial stones are missing, or are out of place.

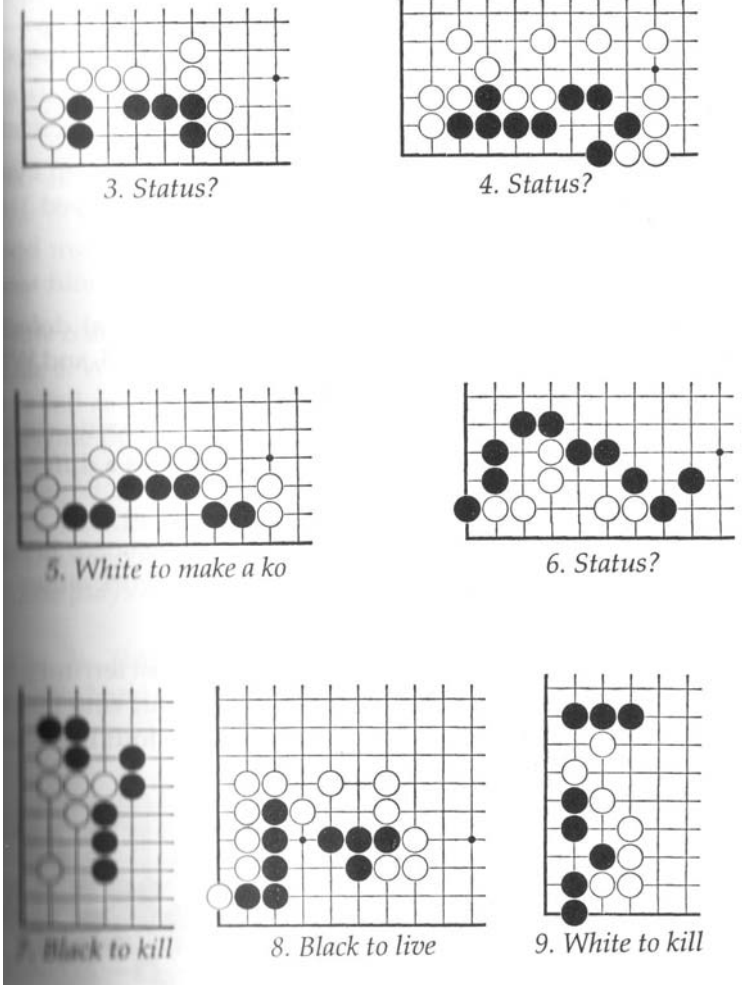
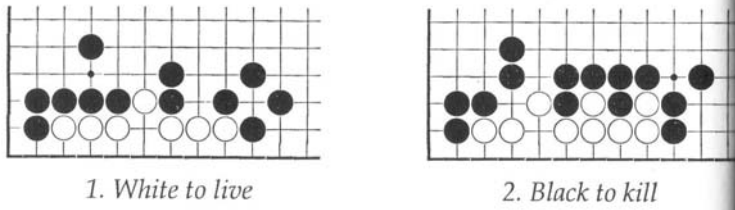


Dia. 1. In this position, if White's stone were at *a* instead of one line higher he would live or die according to sente. Or if the marked stone were white, he would stand alive. The shape he has, however, is dead.

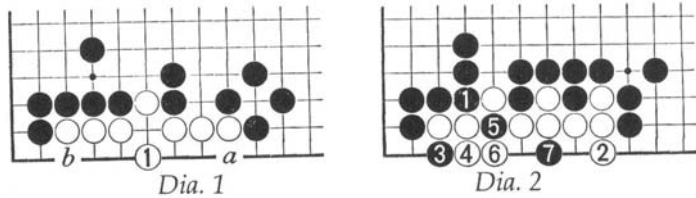
Dia. 2. If he plays 1 to widen his eye space, Black's placement attack at 2 kills him. White 3 makes one eye, but Black 4 makes the second eye false.

Dia. 3. If White starts from the inside with 1, Black can hane at 2, then throw in 4 to make the second eye false.

Problems



Answers



1. Center of symmetry

Dia. 1. White 1 at the center of symmetry leaves an eye on each side. This is White's only way to live; if he played 1 at *a*, for example, Black *b* would kill him.

2. Wedge

Dia. 2. By pushing in at 1, Black creates a fatal defect in White's shape. White 2 is answered at 3, White 4 at 5, and White 6 and Black 7 become miai. (1 at 3 works, too).

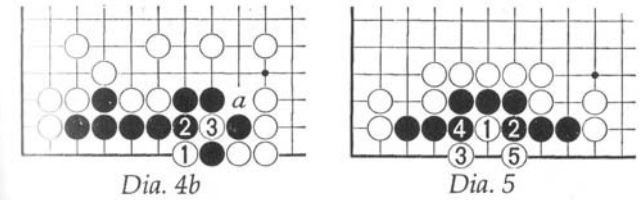
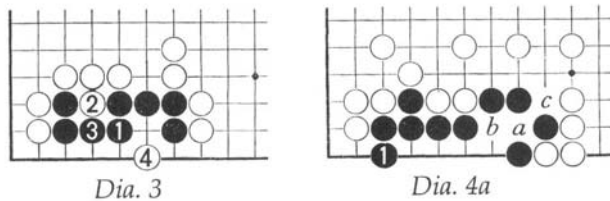
Comparing *Dias. 1* and *2*, we see that the location of the notch in this shape, on center or off center, makes a difference.

3. Black is dead.

Dia. 3. Black 1 at the key point in this three-space notcher shape fails, and no other move could possibly work either.

4. Black can live. White can make a ko.

Dia. 4a. Turning down at 1 gives Black the most territory, five points. Next, White might try a throw-in at *a*, but with Black *b*, White *c*, and Black *a*, Black's eye space is a live four in a row.



Dia. 4b. White cannot kill Black unconditionally, for when he gives atari at 1, Black resists with 2, leading to a ko. White 1 at 3, Black 2, and White *a* would also produce a ko.

5. Four-stone pyramid

Dia. 5. White attacks at the key point with 1, and follows with a good move at 3. If he wins the ko, Black's eye shape will be almost filled by a four-stone pyramid.

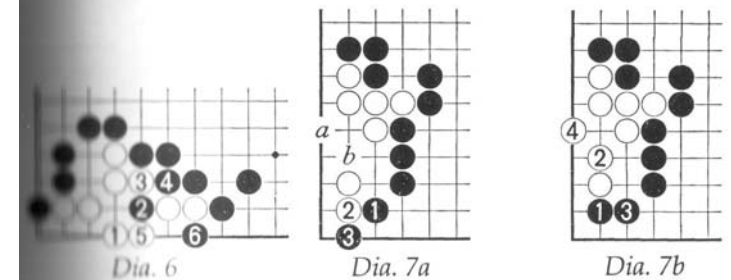
6. White is dead.

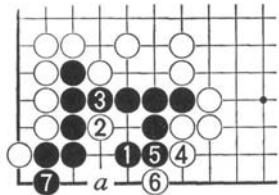
Dia. 6. White 1 is defeated by Black 2, and all other attempts to live fail as well. For instance, if White plays 2, Black plays 1, or if White plays 3, Black plays 6.

7. Incomplete two-space notcher

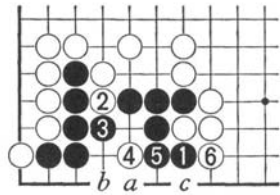
Dia. 7a. After Black 3, White has essentially the same shape as in *Dia. 6*, an incomplete two-space notcher, and is dead. Next, if White plays *a*, Black plays *b*, for example, or if White *b*, Black *a*.

Dia. 7b. This contact play at 1 is wrong, since it lets White live with 2 and 4.





Dia. 8a



Dia. 8b

8. Incomplete door formation

Dia. 8a. Black 1 is correct. It threatens Black 2 and two eyes, so White must play 2 himself, forcing Black 3, before going on to 4. Black 5 then makes 6 and 7 miai, and Black is alive, although White can get a gote seki by playing 8 at *a*.

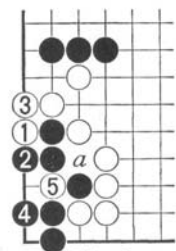
Dia. 8b. Black 1 looks natural, but it risks White 2 and 4. After 6, all Black can get is a ko (Black *a*, White *b*, Black *c*).

9. Throw-in

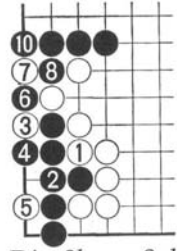
Dia. 9a. White 1 and 3 leave Black no way to live: If he plays 4, White throws in a stone at 5, and Black cannot connect at *a* because of a shortage of liberties. No doubt you can see why Black 4 at *a* would fail.

White can also kill the group by descending directly to 3 instead of playing 1.

Dia. 9b. If White gives atari with 1, Black lives. White cannot even salvage a ko out of his mistake; after Black 10, he cannot connect at 6 because of his own shortage of liberties.



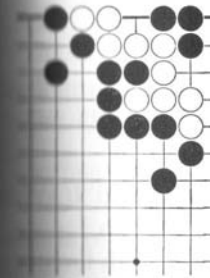
Dia. 9a



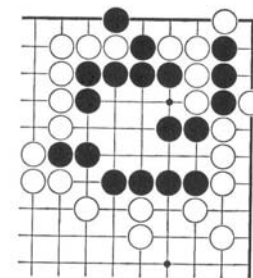
Dia. 9b. 9: ko

13. REVIEW PROBLEMS

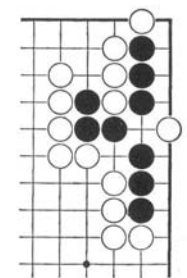
Here is a set of miscellaneous review problems, perhaps somewhat harder than most of the problems that have appeared in this book so far. Settle down, take your time, and see if you can read them out completely.



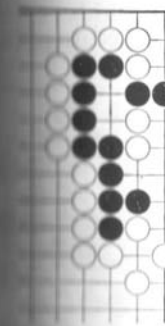
1. White to live



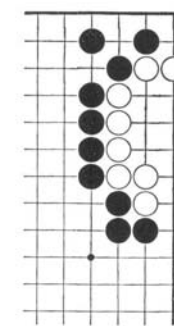
2. Status?



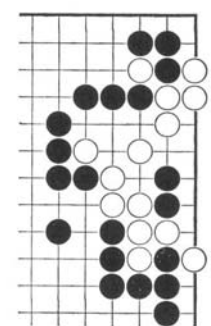
3. Black to live



4. Black to live

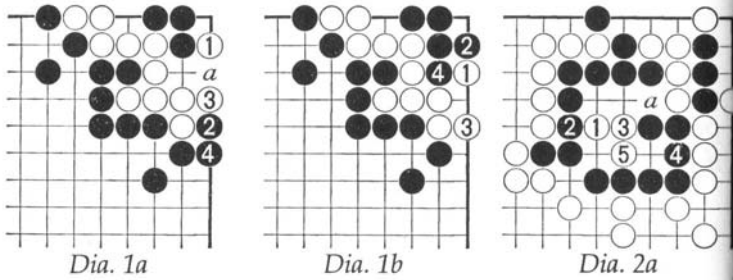


5. Black to kill



6. Black to kill

Answers



1. Seki
 Dia. 1a. White 1 makes the corner a seki. Black 2 at *a* would be fruitless.

Dia. 1b. White 1 here runs into a ko.

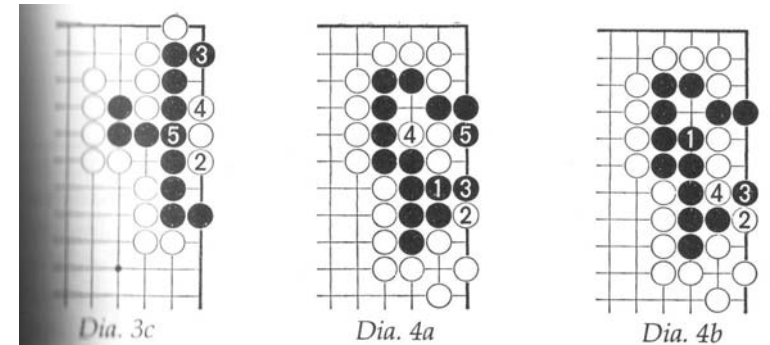
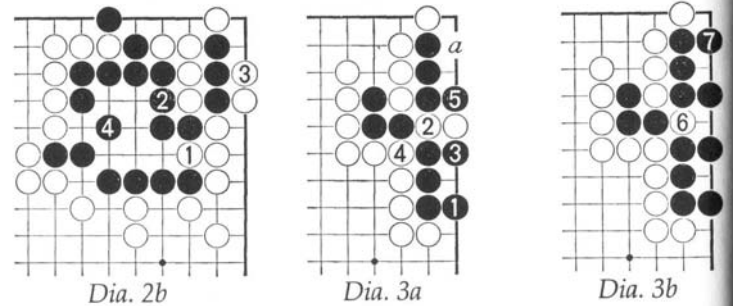
2. Black is alive.
 Dia. 2a. White's best attack yields only a gote seki. If White played 3 at 4, Black would play *a* (in sente), and then 3.

Dia. 2b. If White attacks this way, Black lives with territory.

3. Two eyes
 Dia. 3a. Black can begin at either 1 or *a*, although 1 is better because it affects the outside. After 5 —

Dia. 3b. Black has two eyes, and they are linked together. White can capture three stones, but in gote.

Dia. 3c. This White 2 leads to a seki.



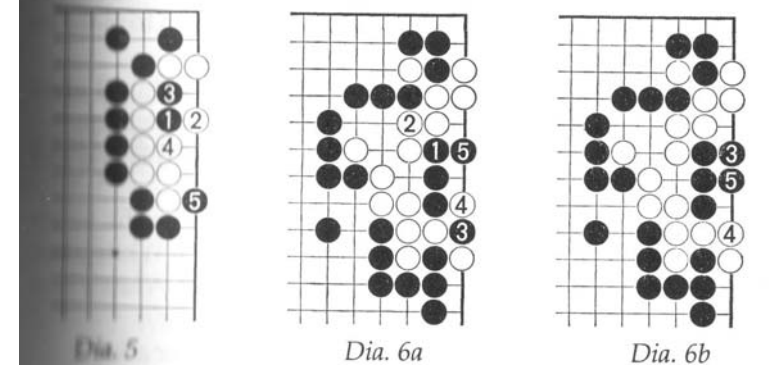
4. Seki
 Dia. 4a. Black 1 is a surprising move, and the result is a seki. Black must not play 1 at 2 or 3, or White 5 will kill him.

Dia. 4b. And Black 1 here leads to a ko, since White 4 is atari.

5. Shortage of liberties
 Dia. 5. Black 1 and 3 are the fatal blow; White falls victim to a shortage of liberties. If White plays 2 at 3, Black 2 kills him on shape.

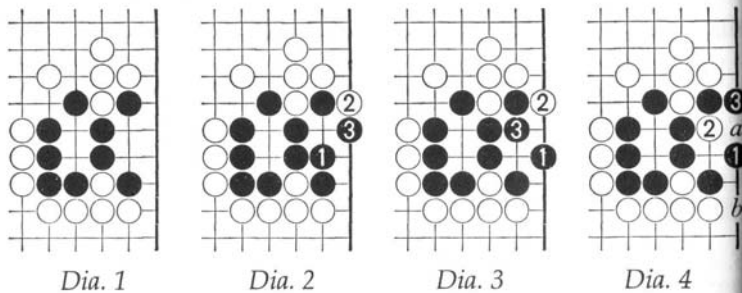
6. Rabbit six
 Dia. 6a. Black 1 to 5 prepare to almost fill White's eye space with a rabbit six. This sequence must be followed strictly.

Dia. 6b. A mistake: Black gets only a gote seki.



14. TO MAKE ONE EYE

So far the groups in this book have had their eye space in a lump, and the problem has been whether or not the attacker could reduce that lump to one eye or not. In this section, the problems are of a different sort. The groups here have one eye already completed, and the issue is whether or not they can make a second.



Dia. 1. In this position, for example, Black has one sure eye in the center. If he finds the right kind of connection to make on the side, he can get a second eye there.

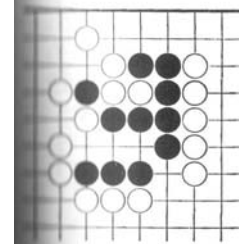
Dia. 2. A solid connection is not the answer. White 2 gives atari, and the best Black can do is to play 3 and fight a ko.

Dia. 3. A diagonal connection is the right move. Now after 2 and 3, Black has his eye.

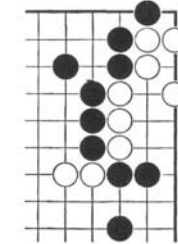
Dia. 4. It does White no good to give atari from the inside with 2, since after 3 he cannot continue at *a*. Also, if White plays 2 at *b*, Black descends to 3 and is alive. *Dia. 3* is White's best sequence.

In none of the following problems is the answer a ko.

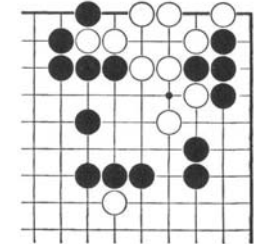
Problems



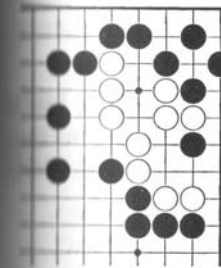
1. Black to live



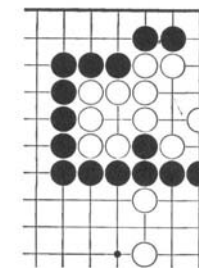
2. Black to kill



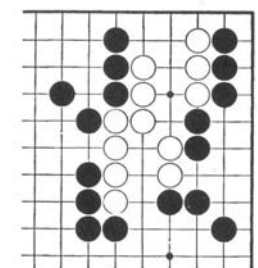
3. White to live



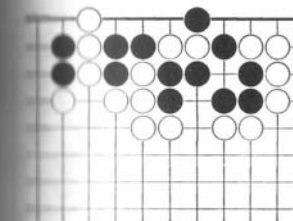
4. White to live



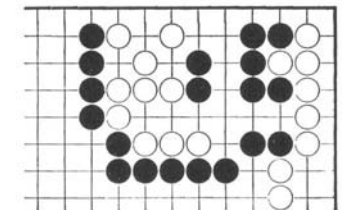
5. Black to kill



6. Black to kill

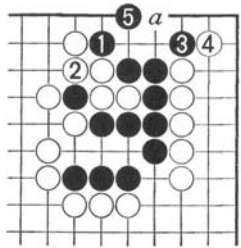


7. White to kill

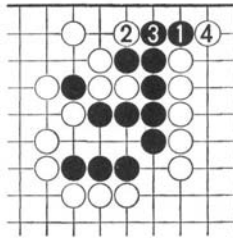


8. Black to kill

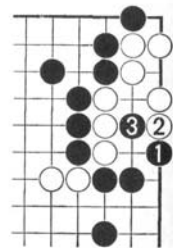
Answers



Dia. 1a



Dia. 1b



Dia. 2a

1. Diagonal connection

Dia. 1a. After 1 and 3, the diagonal connection at 5 or *a* is Black's tesuji. Black 1 must come before Black 3.

Dia. 1b. If Black plays on this side first, he dies.

2. Diagonal tesuji

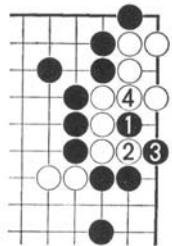
Dia. 2a. Black 1, a diagonal tesuji, threatens Black 2, but if White defends there, Black 3 traps him in a shortage of liberties.

Dia. 2b. This Black 1 fails. After 4 it is Black, not White, who is caught short of liberties.

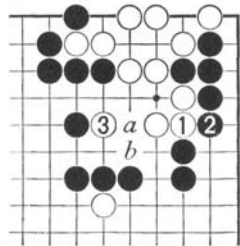
3. One-point jump

Dia. 3a. White 1 and 3 make the second eye. If Black next wedges in at *a*, White can safely capture him with *b*.

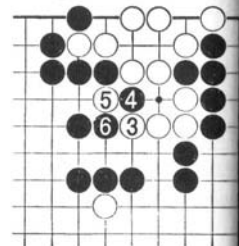
Dia. 3b. White must not play 3 here, or Black 4 and 6 will make the eye false.



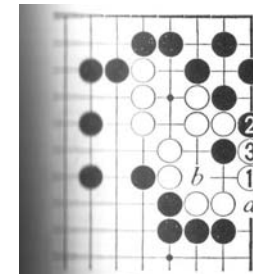
Dia. 2b



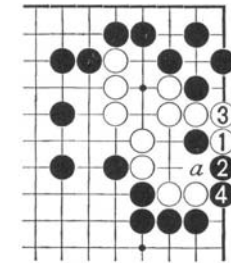
Dia. 3a



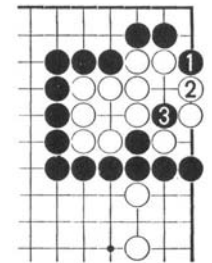
Dia. 3b



Dia. 4a



Dia. 4b



Dia. 5a

4. Undercut

Dia. 4a. White 1, undercutting Black's linkage at 2, is correct. If White plays 1 at 2, then Black 1, White *a*, Black *b*, and White is caught in a snap-back.

Dia. 4b. A failure: White cannot play 5 at *a*.

5. Throw-in

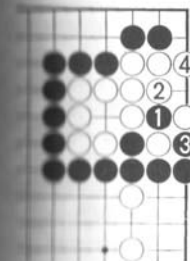
Dia. 5a. Black's hane at 1 sets up the throw-in at 3, and White dies.

Dia. 5b. Black must not begin with the throw-in, or he will have to fight a ko.

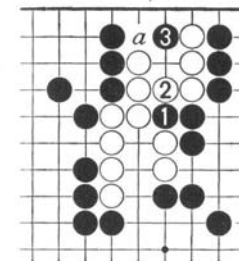
6. Straight ahead

Dia. 6a. Black pushes straight ahead at 1, and if White stops him at 2, Black 3 takes away the eye. If White plays 2 at *a*, Black keeps on pushing at 2, again ruining the eye.

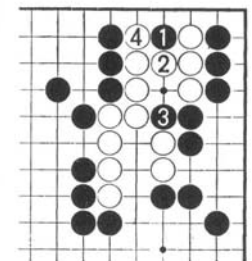
Dia. 6b. If Black jumps in to 1 too early, White lives.



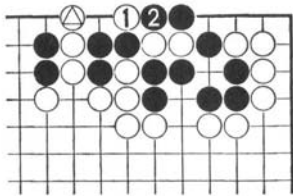
Dia. 5b



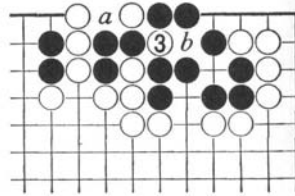
Dia. 6a



Dia. 6b



Dia. 7a



Dia. 7b

7. Snap-back

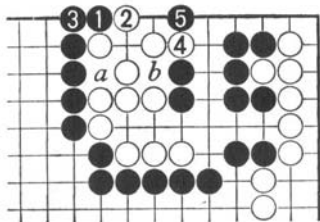
Dia. 7a. The marked white stone is the key to this problem. Because of it, when White plays 1, Black has no choice but to capture at 2.

Dia. 7b. But then White throws in a stone at 3, and Black cannot capture at *a* or he will lose in a snap-back. On the other hand, if Black *b*, White *a* leaves the eye at 3 false.

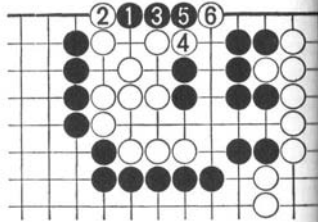
8. Hane and connect

Dia. 8a. All Black has to do is to hane at 1 and connect at 3. The eye above 2 is false (*a* and *b* are miai), and if White tries for another eye with 4, Black 5 makes that eye false, too. (1 at 5 works too.)

Dia. 8b. It is a mistake to start at 1 here. White gets his second eye by capturing three stones.



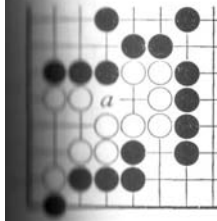
Dia. 8a



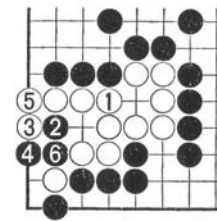
Dia. 8b

15. HALF EYES

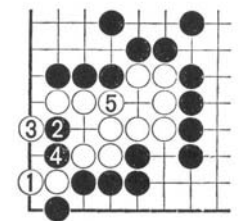
Dia. 1. White has a half eye at *a*; that is, he can make one eye there in gote. How can he live?



Dia. 1



Dia. 2



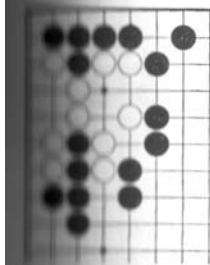
Dia. 3

Dia. 2. If he takes his half eye immediately with 1, Black can completely ruin the rest of his eye space with 2. What he has to do is to secure one eye in the area around 2 while threatening to make two eyes there, keeping the half eye in reserve.

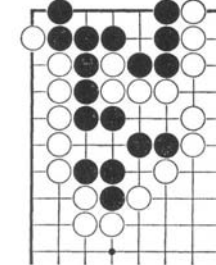
Dia. 3. He should descend to 1. If Black plays 2 at 5, White 2 makes two eyes. If Black takes the key point at 2, White 3 still threatens to make two eyes, and 4 and 5 become miai.

The sequence White 2, Black 1, White 5 is another way to live, but it is inferior.

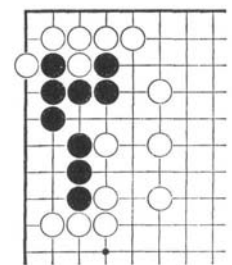
Problems



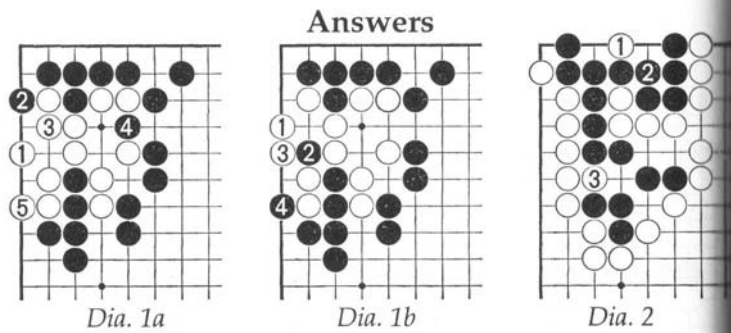
1. White to live



2. White to kill



3. Black to live



1. Diagonal connection

Dia. 1a. White 1 keeps Black from cutting at 3, making one eye, and 4 and 5 become miai for the second eye.

Dia. 1b. This is the wrong diagonal connection. Black can hold White to one eye on the side in sente with 2 and 4.

2. Snap-back

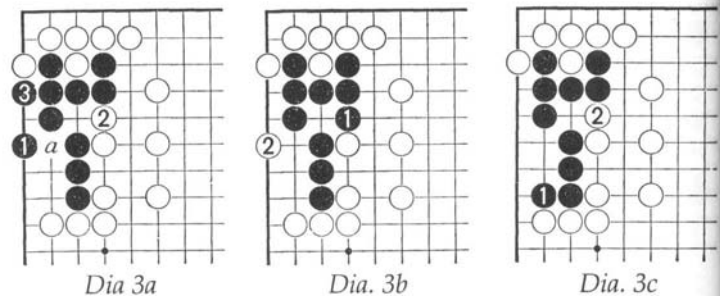
Dia. 2. White 1 threatens a snap-back at 2.

3. Diagonal play

Dia. 3a. The diagonal play at 1 is the key to this problem. Black is assured of one eye at the point *a*, and a second eye can be had at either 2 or 3.

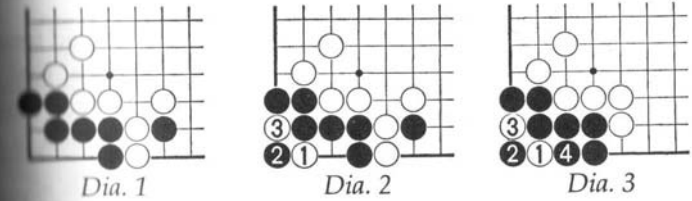
Dia. 3b. If Black began at 1, White 2, the key point again, would destroy all of his eye space at the edge.

Dia. 3c. This Black 1 is too greedy. White 2 leaves Black with a dead shape.



16. BENT FOUR IN THE CORNER

We are now ready to tackle some corner shapes, starting with the notorious bent four in the corner. This is the name for two related types of positions: a basic one, which becomes ko; and a derived one, which is dead.



Dia. 1. Black's eye shape in this diagram is the basic bent four in the corner. It is an exception to the rule that four spaces in a row are alive.

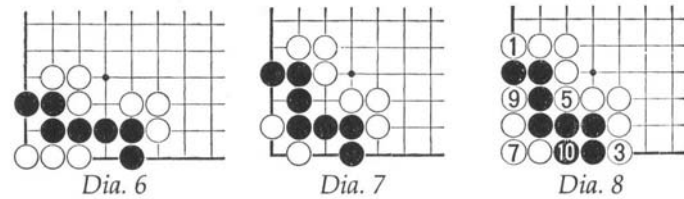
Dia. 2. When Black has fewer than two outside liberties, White can gain a direct ko by attacking at 1.

Dia. 3. When Black has two or more outside liberties, he can survive White's attack.



Dia. 4. Here is another possible basic shape of bent four in the corner, one which is sometimes left when four enemy stones have been captured.

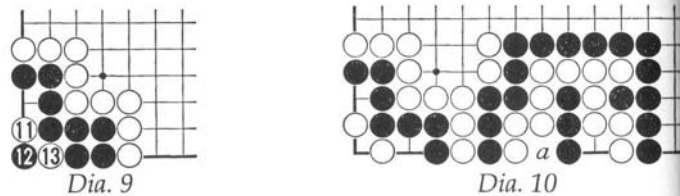
Dia. 5. Again, White can force a ko.



Dias. 6 and 7. These diagrams show two of the derived forms of bent four in the corner. In both cases, Black seems at first to be alive in seki, but that is not so; he is dead. There is even a rule of the game that states this, the justification for which is as follows.

Dia. 8. At the end of the game, White can first go around the board removing all Black's ko threats, then take away his outside liberties, and finally give atari at 9, forcing him to capture at 10.

Dia. 9. Then White plays back in at 11, and Black, without any ko threats, is defenseless.



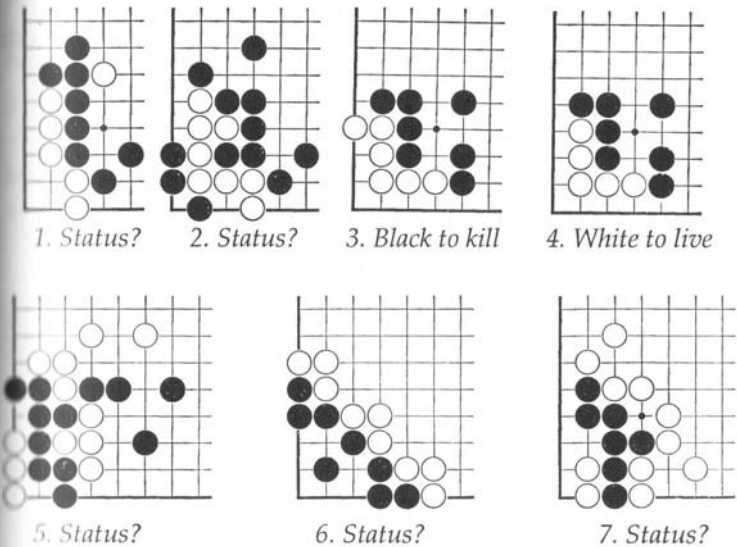
It is important to realize that although Black may be dead in *Dias. 6 and 7*, it is no easy matter for White actually to get him off the board. If Black can counterattack against some of the white stones surrounding his group, he stands good chances in a race to capture. First White has to fill all those outside liberties; then Black has three (*Dia. 6*) or four (*Dia. 7*) effective internal liberties; and besides that, there is the ko.

When the surrounding white stones survive, the Japanese rule is that at the end of the game, White may always remove the black stones as dead without actually removing ko threats or filling liberties. Usually this is equivalent to what would happen if White made sure that all the neutral points on the board were gone before he began playing inside his own territory to remove ko threats etc., and if Black were not allowed to pass, so that he would have to play inside his own territory, too.

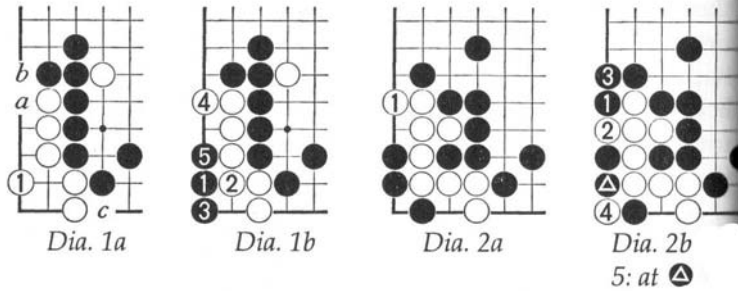
One can, however, contrive situations such as the one in *Dia. 10*, where Black has a ko threat at *a* that White cannot very well remove. The Japanese rule is unfair to Black in positions like this, and there have been many proposals to change it, but it remains on the books.

Its defects, however, need not concern us here, especially since it is logically correct almost all of the time anyway. Try to solve the following problems.

Problems



Answers



1. White can live. Black can kill.

Dia. 1a. White 1 is the best way to live; it makes the strongest shape. White *a* would work, too, but then Black could play *b* or *c* in sente.

Dia. 1b. Black 1 to 5 form a bent four in the corner.

2. White can live. Black can kill.

Dia. 2a. If White plays 1, he is alive in seki.

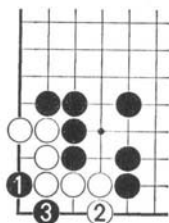
Dia. 2b. But if Black plays 1 and forces White in to 2, the result is a bent four in the corner, and White is dead.

3. Placement

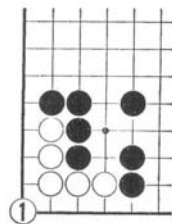
Dia. 3. Black's placement attack at 1 causes a bent four.

4. Center of symmetry

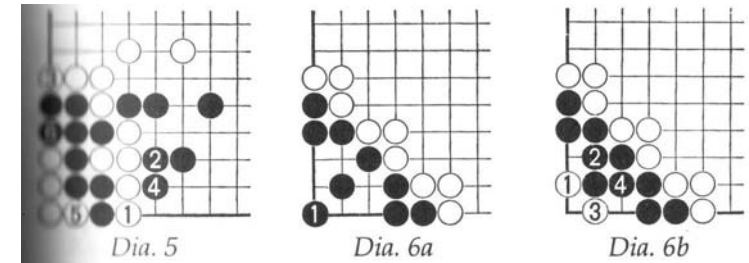
Dia. 4. White must play 1 at the center of symmetry.



Dia. 3



Dia. 4



Dia. 5

Dia. 6a

Dia. 6b

5. Black is alive.

Dia. 5. This is simply an exercise in liberty-counting. Even if White goes first, after capturing at 6, Black has three liberties on the inside, and White has only two on the outside.

6. Black can live. White can kill.

Dia. 6a. This formation is made and fairly often left as it is by unwitting beginners. It certainly looks big enough to be alive, but the fact is that Black needs to add another stone to it. Black 1 leaves the fewest ko threats.

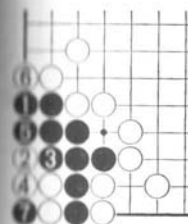
Dia. 6b. If Black does not add another stone, White can kill him with 1 and 3.

7. Black can make a ko. White can kill.

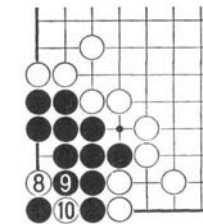
Dia. 7a. Black starts by descending to 1 — he needs all the eye space he can get in this position — and White has to answer at 2. The sequence up to 7 then follows naturally, leaving —

Dia. 7b. A bent four in the corner.

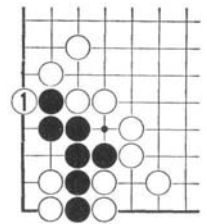
Dia. 7c. If White goes first and plays 1, Black dies.



Dia. 7a



Dia. 7b

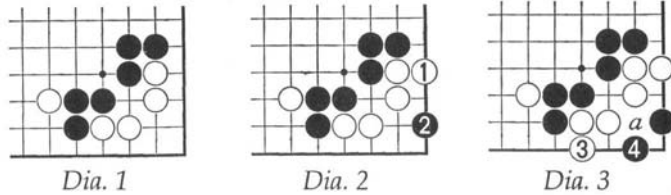


Dia. 7c

17. THE ONE-TWO POINTS, ETC.

From the bent four we move on to some easier corner positions. This section covers a few common techniques.

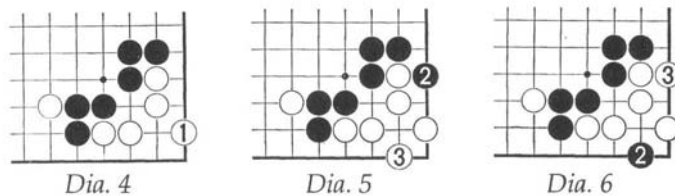
There is a saying that the one-two points are the keys to the corner. As an illustration of this, consider the following problem.



Dia. 1. White to play: his group looks pretty small, but this is the corner, not the side, and even groups of this size may be able to live. Where should he play?

Dia. 2. It will not do for White to try to enlarge his eye space with 1. Black 2, at the one-two point, makes it impossible for White to form two separate eyes.

Dia. 3. If White enlarges his eye space again, trying for a seki, Black takes the second one-two point and White is dead. If White next plays *a*, the position is a bent four in the corner.



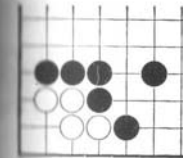
Dia. 4. The solution is for White to take one of the one-two points for himself with 1.

Dia. 5. If Black hanes at 2, White takes the second one-two point and has two secure eyes.

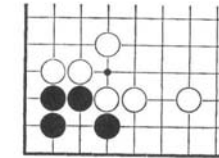
Dia. 6. Black 2 at the other one-two point is strong but suicidal. White makes one eye with 3 and has Black 2 captured for his second eye.

Keeping your eye on the one-two points should help you to solve half of the following problems, and common sense should help you through the rest.

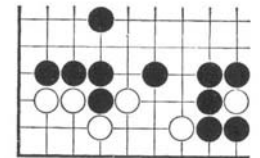
Problems



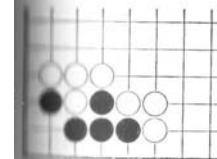
1. Status?



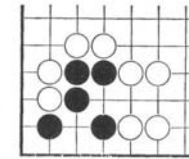
2. Status?



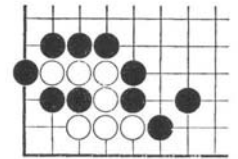
3. Status?



4. Status?

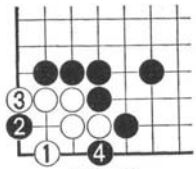


5. Black to live

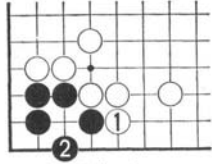


6. White to live

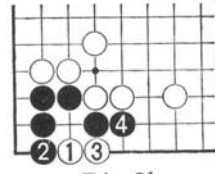
Answers



Dia. 1



Dia. 2a



Dia. 2b

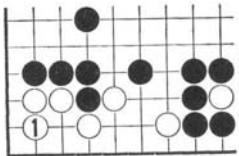
1. White is dead.

Dia. 1. White's eye space is roughly a bulky five, which makes White 1 the key point. Black takes the other one-two point, however, and White cannot live.

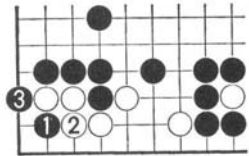
2. Black is alive.

Dia. 2a. If White blocks from the outside at 1, Black has no trouble living with 2.

Dia. 2b. If White tries to take the key point for himself, Black answers at 2, and White is not going to get anywhere by playing 3.



Dia. 3a

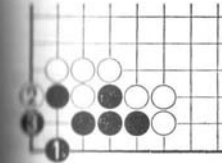


Dia. 3b

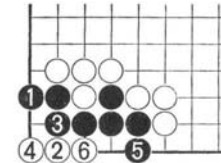
3. White can live. Black can kill.

Dia. 3a. White 1 makes essentially the same live shape as in the previous problem. White could also live by playing at either one-two point.

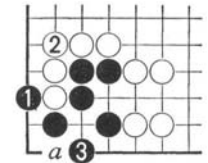
Dia. 3b. Black 1 threatens Black 2, and White dies. In this position the two-two point is the key point.



Dia. 4a



Dia. 4b



Dia. 5

4. Black can make a ko. White can kill.

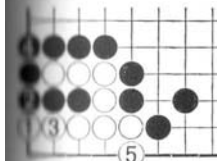
White can obviously kill Black, so the only question is what happens when Black goes first.

Dia. 4a. Ko, with 1 and 3, is the best Black can do. If he plays 1 at 3, White 2 at 1 kills him.

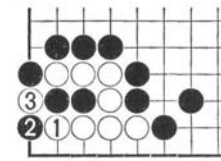
Dia. 4b. And if he descends to 1 here, White 2 causes a bent four in the corner.

5. Hane

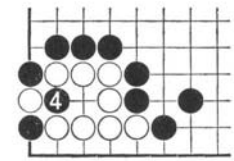
Dia. 5. The hane at 1 is Black's sente, and this enables him to live; he has a sure eye at *a*. The fact that 1 and 3 form an eye is another useful property of the corner.



Dia. 6a



Dia. 6b



Dia. 6c

6. One-two point

Dia. 6a. White must play 1 at the one-two point.

Dia. 6b. If he carelessly gives atari with 1, Black will not connect, but will take the one-two point himself. White 3 captures two stones, but —

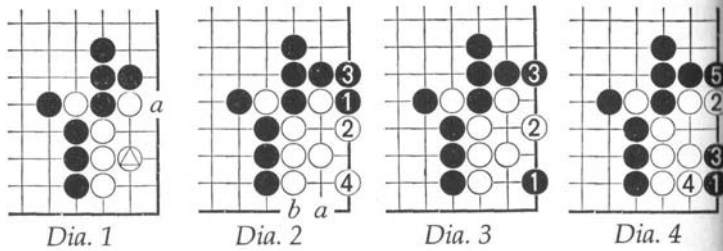
Dia. 6c. Black recaptures and White is dead.

18. PLACEMENT: ATTACK AND DEFENSE

We are ready for another look at some placement techniques.

Dia. 1. In this position White is hoping to live in ko. (Actually, the marked white stone should have been played at *a*, but that is another matter.)

Dia. 2. If Black gives atari at 1, White has his wish; White 2 forms a ko. If Black connects at 3. White plays 4, and after Black *a* and White *b*, the life of the corner still depends on the ko.



Dia. 3. If Black attacks correctly, however, he can kill the corner unconditionally. His first move is the placement at 1. The eye White makes with 2 is undercut by Black 1, and destroyed by Black 3.

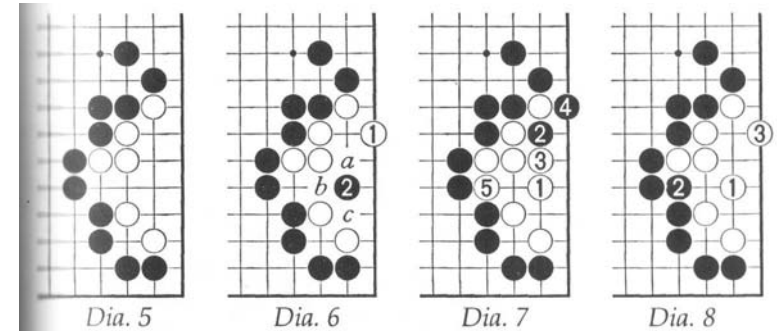
Dia. 4. If White descends to 2 to try for more eye space, Black can kill him with 3 and 5, which threaten a snap-back.

Dia. 5. (next page). Turning to defense, let's see how White can live in this position.

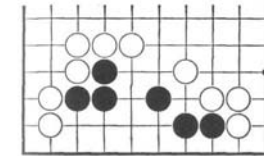
Dia. 6. If he makes the diagonal connection at 1, Black's placement at 2, threatening *a*, *b*, *c*, kills him.

Dia. 7. The solution is for White to prevent Black's placement attack by playing 1 himself. If Black captures a stone with 2 and 4, White can live with 5.

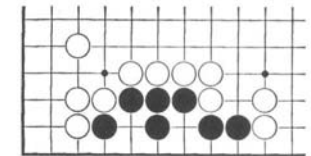
Dia. 8. If Black plays 2 here, White can live by playing 3.



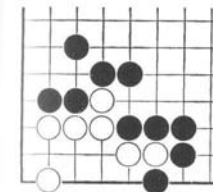
Problems



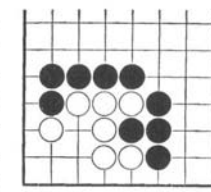
1. Status?



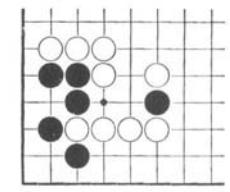
2. White to kill



3. Black to kill

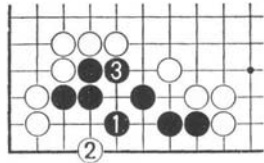


4. Black to kill

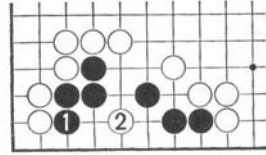


5. White to kill

Answers



Dia. 1a

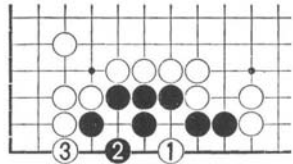


Dia. 1b

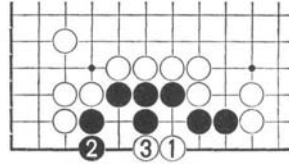
1. Black can live. White can kill.

Dia. 1a. Black 1 takes the key point. White 2 reduces Black to one eye along the lower edge, but he has his second eye at 3.

Dia. 1b. If Black tries to widen his eye space with 1, White's placement at 2 kills him. Black's shape in this problem is like the three-space notcher with one leg of problem 4 on page 43.



Dia. 2a



Dia. 2b

2. Undercutting the eye

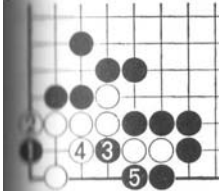
Dia. 2a. White 1 undercuts the eye that Black tries to make with 2, and White 3 destroys it.

Dia. 2b. A variation. If White played 1 at 2, the result would be a ko fight.

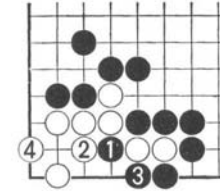
3. One-two point

Dia. 3a. First Black must occupy the one-two point with 1, to spoil White's eye shape there. Then he can finish the job by capturing with 3 and 5.

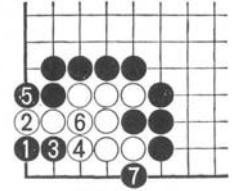
Dia. 3b. If Black starts with 1 here, White answers at 2 and lives.



Dia. 3a



Dia. 3b

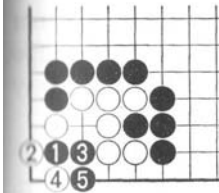


Dia. 4a

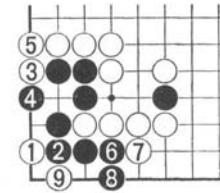
4. Squeeze

Dia. 4a. Black cannot stop White from forming two eyes, but he can squeeze one of them shut with 1, 3, and 5, then kill White with 7.

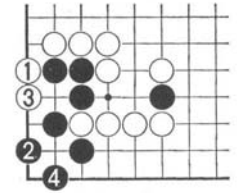
Dia. 4b. This clamping move does not work so well; White can gain a ko with 2 and 4.



Dia. 4a



Dia. 4b



Dia. 5a

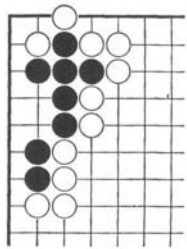
5. Bent four in the corner

Dia. 5a. Once again the attack starts at the one-two point. Black's strongest defense only leads to death in a bent four in the corner.

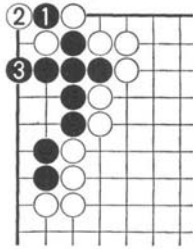
Dia. 5b. If White starts with the hane, Black can live by taking the key point at 2.

19. THROW-INS

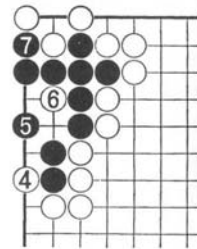
Throw-ins often serve to kill groups, generally by causing false eyes, and they have cropped up many times in the problems so far. In this section, however, we shall see them used as tools for causing shortages of liberties and making groups live.



Dia. 1



Dia. 2



Dia. 3

Dia. 1. The classic case of this technique occurs in the corner of this diagram. Black appears to have a common dead shape — a two-space notcher with only one leg — but there is a way for him to live.

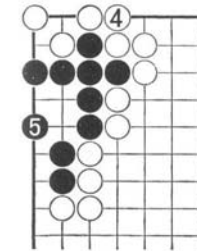
Dia. 2. Black makes a throw-in at 1, then descends to 3.

Dia. 3. If White insists on trying to spoil his eye shape with, say, 4 and 6, Black gives atari at 7. White is caught short of liberties and cannot connect.

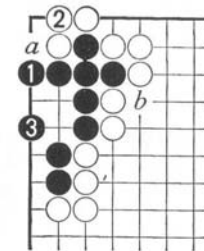
Dia. 4. (next page) If White connects at 4 to save his two stones in the corner, Black can live by playing 5.

Dia. 5. Black can also live simply by descending to 1 and threatening the throw-in, but that is not as good for him as *Dia. 2*. The reason has to do with the life and death of his own group, but with that of the white stones. White can connect at

2 in sente, leaving behind the possibility of White *a* and an eye in the corner. This could be quite important if Black later cut at *b* and tried to attack.

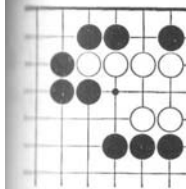


Dia. 4

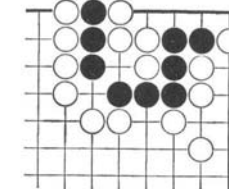


Dia. 5

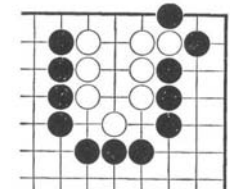
Problems



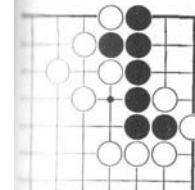
1. Status?



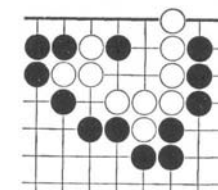
2. Status?



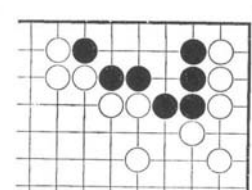
3. Status?



4. Status?



5. White to live



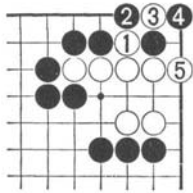
6. Black to live

Answers

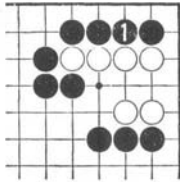
1. White can live. Black can kill.

Dia. 1a. White 5 gives White one sure eye on the right side, and Black cannot avoid the loss of at least two stones in the corner, which makes for the second eye.

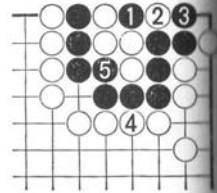
Dia. 1b. Black 1 obviously kills White.



Dia. 1a



Dia. 1b

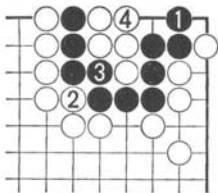


Dia. 2a

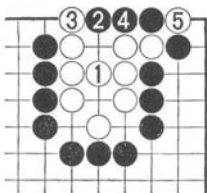
2. Black can live. White can kill.

Dia. 2a. After making the throw-in at 1, Black can squeeze White with 3 and 5 to live unconditionally.

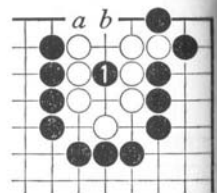
Dia. 2b. Black 1 without the throw-in leads to death. 2 and 4 are also the combination White would use to kill Black if he went first.



Dia. 2b



Dia. 3a



Dia. 3b

3. White can live. Black can kill.

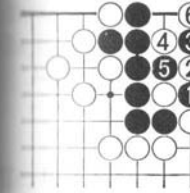
Dia. 3a. White 1 draws Black in to 2. The throw-in comes at 5, and no doubt you can see the rest.

Dia. 3b. Black 1 is a neat way to kill White without letting *a* or *b* become his sente.

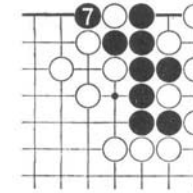
4. Black can live. White can kill.

Dia. 4a. Black 1 and 3 are the right combination. (If Black played 3 at 5, then White would play 4 at 3 and get a ko.) It does White no good to persevere with 4 and 6.

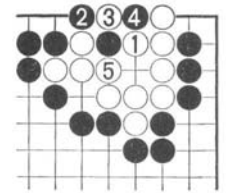
Dia. 4b. Black plays 7 to gain an outside liberty and is unconditionally alive.



Dia. 4a



Dia. 4b

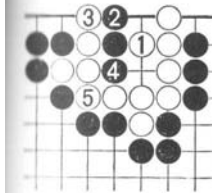


Dia. 5a

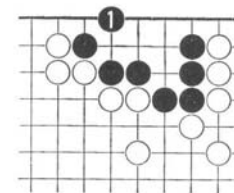
5. Clamp

Dia. 5a. White begins by clamping Black's invading stone with 1. If Black tries to link underneath, White has the throw-in at 3.

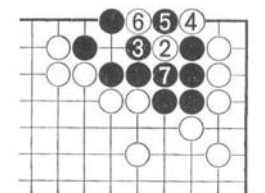
Dia. 5b. The best Black can do, provided he can tolerate White 5, is to play 2 and 4 and get a seki.



Dia. 5b



Dia. 6a



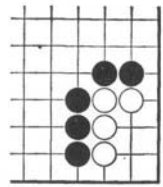
Dia. 6b

6. Diagonal connection

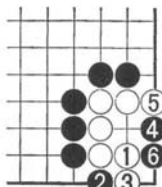
Dia. 6a. Black can live unconditionally by making this diagonal connection.

Dia. 6b. If White attacks he must start at 2, but Black traps him with the throw-in at 5.

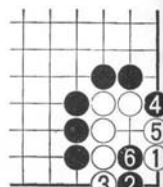
20. THE L GROUP



Dia. 1



Dia. 2

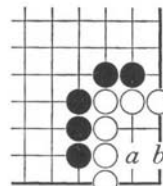


Dia. 3

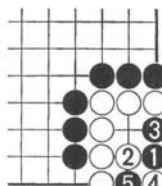
Dia. 1. This L-shaped group in the corner, which we shall call the L group, occurs again and again. Barring help from surrounding positions, it is dead.

Dia. 2. White's best attempt to live starts at the two-two point, but Black can force the 2-3 and 4-5 exchanges, then kill White with 6.

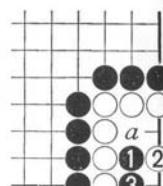
Dia. 3. Another key eye-making point in the L group is this White 1, but it fails if Black plays 2. The one-two points are miai.



Dia. 4



Dia. 5



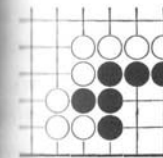
Dia. 6

Dia. 4. This is the L group with both its feet on the ground. White's eye shape is a rectangular six, and he is alive. If Black attacks at *a*, White defends at *b*, and vice versa.

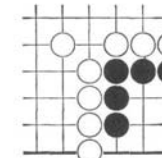
Dia. 5. Because of the special nature of the corner, however, White is in danger if he starts to lose his outside liberties. When there is one outside liberty, Black can get a ko by attacking at 1. This sequence is reminiscent of the bent four in the corner, but now the ko is a two-step ko; because of the outside liberty, Black will have to ignore two ko threats to win it.

Dia. 6. With no outside liberties, the situation is much worse. Black attacks at 1 this time, and since White cannot play 4 at *a*, he dies.

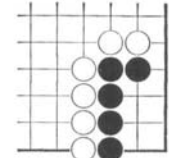
Problems



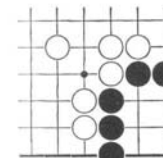
1. Status?



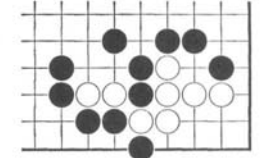
2. Status?



3. Status?



4. Status?



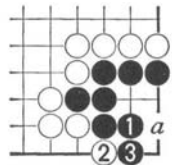
5. White to live

Answers

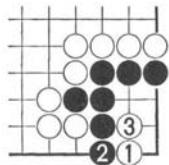
1. Black can live. White can kill.

Dia. 1a. Black can play 1. White 2 and Black 3 leave him with a live four in a row. He can also live by playing 1 at *a*.

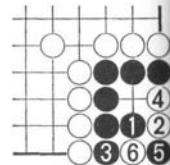
Dia. 1b. White has many ways to kill Black, among which the 1-3 combination has the advantage of leaving Black only three liberties.



Dia. 1a



Dia. 1b



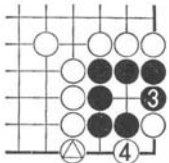
Dia. 2a

2. Black can make a ko. White can kill.

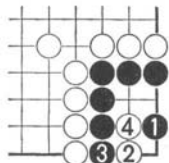
Dia. 2a. This time Black's best defense only produces a ko.

Dia. 2b. If Black plays 3 here, White 4 catches him short of liberties and he dies outright. Without the marked stone, however, Black 3 would be the correct way to live.

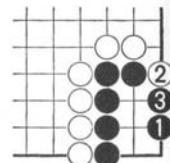
Dia. 2c. This Black 1 fails completely because of the shortage of liberties.



Dia. 2b



Dia. 2c



Dia. 3a

3. Black can live. White can kill.

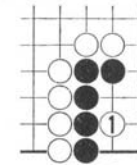
Dia. 3a. The one-two point is the place for Black to play. White 2 and Black 3 leave him with a live four in a row.

Dia. 3b. This time Black 1 at the two-two point is not so good. White can force a ko.

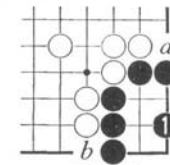
Dia. 3c. White has many ways to kill Black, of which this is one.



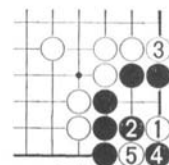
Dia. 3b



Dia. 3c



Dia. 4a

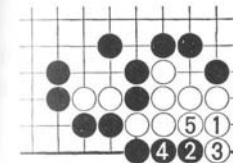


Dia. 4b

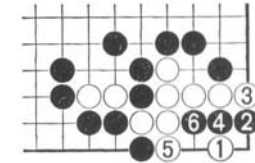
4. Black can live. White can make a ko.

Dia. 4a. Black's best living move is 1. Even after White plays *a* and *b*, Black will need no further defense, so he is alive with five points of territory.

Dia. 4b. White to play: the combination of 1 and 3 forces Black to submit to a direct ko.



Dia. 5a



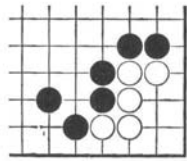
Dia. 5b

5. Two-two point

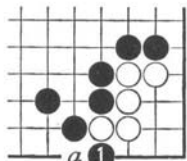
Dia. 5a. White plays 1 at the two-two point and answers Black 2 at 3. White 5 puts three stones into atari, and Black cannot save them.

Dia. 5b. White 1 at the one-two point is a failure.

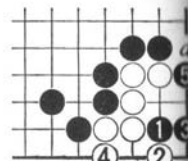
21. THE FIRST L+1 GROUP



Dia. 1



Dia. 2



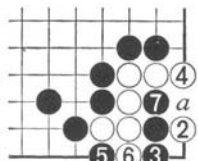
Dia. 3

Dia. 1. This group, another very common one, is the L group with a leg extending from the long branch of the L, and we shall call it the first L+1 group. It lives or dies according to sente. This should make sense, since it is one stone larger than the barely dead L group.

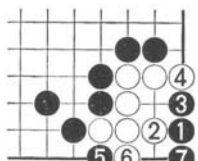
Dia. 2. One way for Black to kill it is to play this hane and reduce it to the L group. A quick review of the sequences in the last section should convince you that White is now dead. Black 1 would not work, however, if there were a white hane at *a*.

Dia. 3. Another way for Black to kill the L+1 group is with the inside attachment at 1. After Black 3, White 4 and Black 5 are miai. This Black 1 would obviously fail, however, if there were a white hane at *a*, and would not work perfectly if there were a hane on the lower side, either.

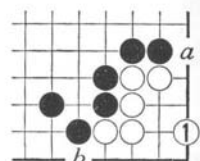
Dia. 4. A variation of the previous sequence: when White clamps at 2, Black must not reply at *a* or White will take the point 3 and have a ko.



Dia. 4



Dia. 5

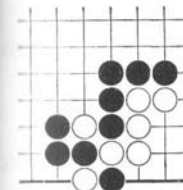


Dia. 6

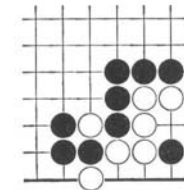
Dia. 5. Yet a third way for Black to kill White is with this placement attack, which leads to a bent four in the corner. (If Black played 3 at 4, White 3 would cause a ko.)

Dia. 6. The best way for White to live is to play 1 at the one-two point. This gives him a strong shape — even if Black stones appear later at both *a* and *b*, he will still be alive — and in general he can count his corner territory as six points.

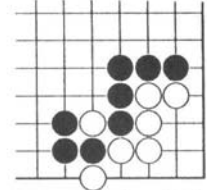
Problems



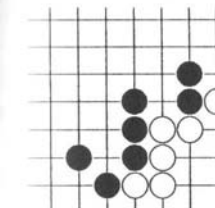
1. White to live



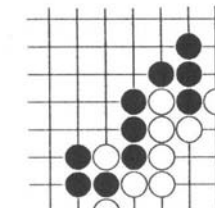
2. Status?



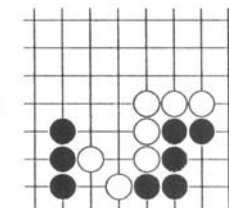
3. Black to kill



4. Black to kill

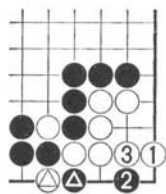


5. Status?

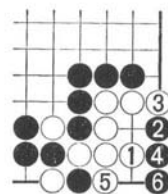


6. Status?

Answers



Dia. 1a



Dia. 1b

1. One-two point

Dia. 1a. White 1 at the one-two point makes proper use of the white marked stone. This problem arises from a mistaken attack. Black could have killed White by playing his marked stone at 1 instead.

Dia. 1b. White 1 at the two-two point fails; Black can form a bent four in the corner.

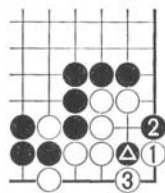
2. White can make a ko. Black can kill.

Dia. 2a. White clamps the marked stone with 1, and Black can only play 2 and allow the ko. This problem also arises from a mistaken attack; Black should have played his marked stone at 1.

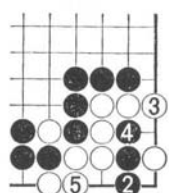
Dia. 2b. If Black descends at 2, the result is a seki. He cannot play 4 at 5, because White will reply at 4.

3. Placement

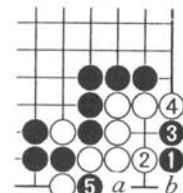
Dia. 3. The placement is unaffected by the hane on the lower edge. After Black 5, *a* and *b* are miai and White is dead.



Dia. 2a



Dia. 2b



Dia. 3

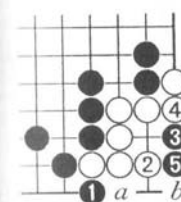
4. Hane

Dia. 4. Black 1 is the correct attack when White has a hane on the right edge. After Black 5, *a* and *b* are again miai. Black could also play 5 at *a*.

5. Black can make a thousand-year ko. White can live.

Dia. 5a. The placement at Black 1 is the best attack, and White 2 is the best defense. The sequence through Black 7 creates a thousand-year ko.

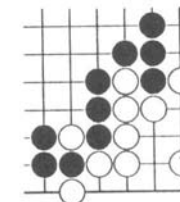
Dia. 5b. White 1 lives.



Dia. 4



Dia. 5a



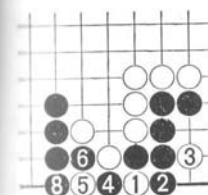
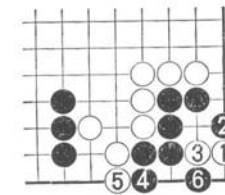
Dia. 5b

6. Black is alive.

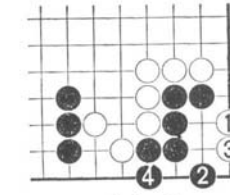
Dia. 6a. White 1 and 3 reduce the corner to one eye, but Black can link up to the outside. There is no ko, since White is caught in a shortage of liberties.

Dia. 6b. This White 1 also fails, because Black 4 threatens to link up to the outside. If White attacked with 1 at 3, the same moves could be played in a different sequence.

Dia. 6c. This White 1 is also easy to answer.

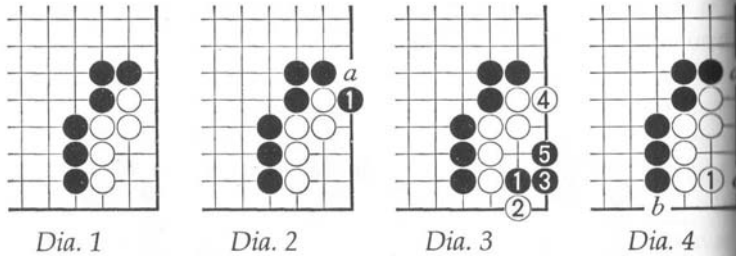
Dia. 6a
7: at 1

Dia. 6b



Dia. 6c

22. THE SECOND L+1 GROUP



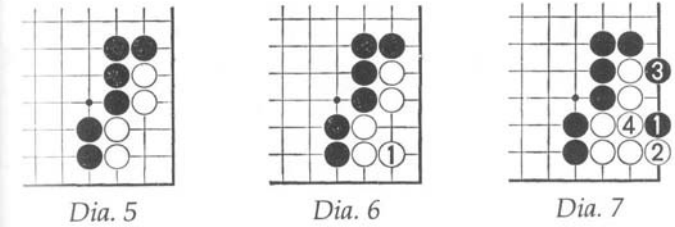
Dia. 1. This is the second L+1 group, with a leg on the short side of the L. Like the first L+1 group, it lives or dies according to sente.

Dia. 2. One way for Black to kill it is to hane under the leg, reducing White to the dead L group. This Black 1 would not work, of course, if there were a hane at *a*.

Dia. 3. Another way to kill it is to play Black 1 at the two-two point, which is really the key point for both attack and defense in this shape. After 5, White's eye space can be almost filled with a bulky five, so he is dead.

Dias. 2 and 3 show Black's only killing attacks. You may verify that all other possible Black 1's lead to, at best, ko.

Dia. 4. White's best way to live is, in general, to play at the two-two point. His group is then safe even if Black later descends to both *a* and *b*. That would not be true if White had lived by playing 1 at *c*.

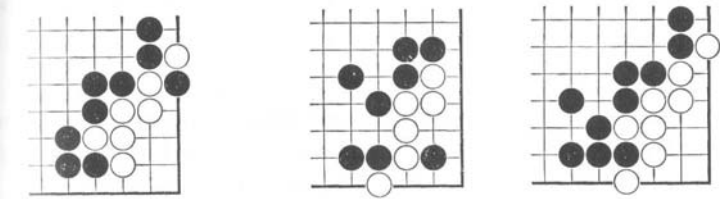


Dia. 5. More common than the standard L+1 group is this one, in which White has only a weak leg. Surprisingly, his status is the same as before; he lives or dies according to sente.

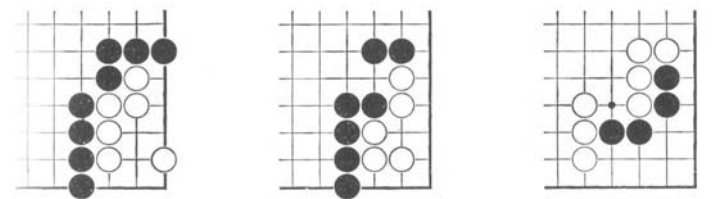
Dia. 6. By playing at the two-two point, White lives. If Black played there, then of course White would be dead.

Dia. 7. This shows that after the last diagram White is really alive.

Problems

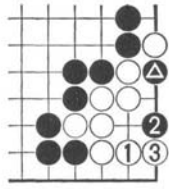


1. White to live 2. White to make a ko 3. Status?

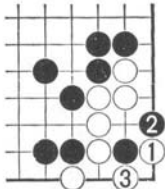


4. Black to kill 5. Black to make a ko 6. Black to live

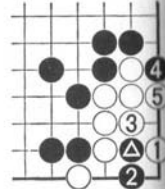
Answers



Dia. 1



Dia. 2a



Dia. 2b

1. The two-two point

Dia. 1. The two-two point is the key point in this problem, indeed, it is where Black should have played the marked stone in the first place. White lives easily.

2. The one-two point

Dia. 2a. The sequence from 1 to 3 is necessary, and White has his ko.

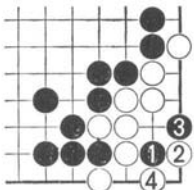
Dia. 2b. If Black plays 2 here, the usual resistance to White 1, White can live unconditionally because of the hane on the lower side. This problem also comes from a mistaken attack; Black's marked stone should have been played at 4.

3. White can live. Black can make a ko.

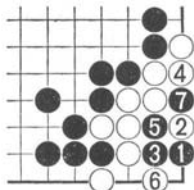
Dia. 3a. This problem is just an application of the previous two problems. Black can gain a ko by playing 1 and 3.

Dia. 3b. Black has other ways to make a ko. One is shown in this diagram. Another is Black 2, White 1, Black 3, White 6.

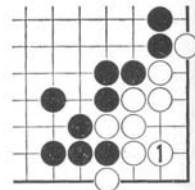
Dia. 3c. White can, of course, live.



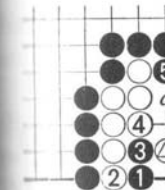
Dia. 3a



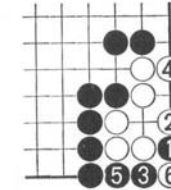
Dia. 3b



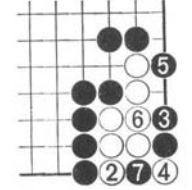
Dia. 3c



Dia. 4



Dia. 5a



Dia. 5b

4. Shortage of liberties

Dia. 4. Black attacks with 1, 3, and 5, and a shortage of liberties keeps White from playing 6 at *a*. White would not have had these problems if he had positioned his marked stone correctly at 3.

5. Shortage of liberties again

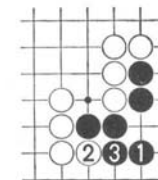
Dia. 5a. Black 1 finds the vital spot. White is unable to play 4 at 5 because of a shortage of liberties. By following the sequence shown, at least he gets to make the first ko capture.

Dia. 5b. White 2 here also produces a ko, but now Black gets to make the first ko capture.

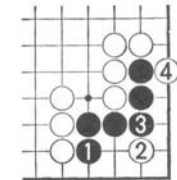
6. Two-two point

Dia. 6a. Black must play 1 at the two-two point to make eye shape.

Dia. 6b. If he plays 1 here, White kills him by taking the key point. After 4, it is as if Black had had the first L+1 group and White had killed it by playing 2.

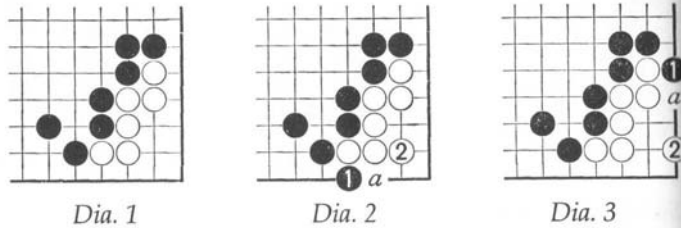


Dia. 6a



Dia. 6b

23. THE L+2 GROUP

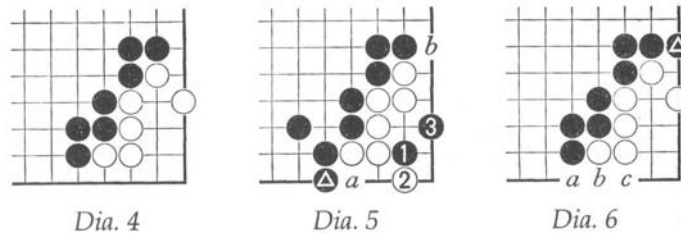


Dia. 1. This is the L group with legs on both sides, or the L+2 group, which arises frequently from invasions of the corner. It is alive.

Dia. 2. If Black attacks at 1, White 2 is the correct defense. It is dangerous for White to play 2 at *a*. After defending his shape correctly as shown, he can play *a* in sente in the endgame, and his territory can be counted as six points.

Dia. 3. If Black attacks from this side, White's correct defense is at the one-two point. Again, he can play *a* in sente later and count his corner as six points. White 2 at *a* would leave some danger of a seki or indirect ko in the corner.

Combining *Dias.* 2 and 3, we see that Black can hane on either side in sente, but once he hanes on one side, he can no longer hane on the other side in sente. Internal attacks, such as Black 1 at 2 in *Dia.* 2 or 3, do not work; this I leave for you to verify.

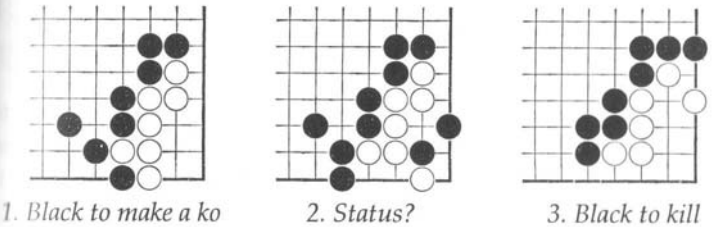


Dia. 4. This is a variation of the L+2 group, in which White has made a diagonal connection on the right side instead of a solid connection. Again, he is alive.

Dia. 5. The most important difference between the solid and diagonal connections is that when White makes the solid connection, Black can descend with the marked stone in sente. If White ignores this move, Black can attack with 1 and 3. (If White plays 2 at 3, Black plays 3 at *a*.) Black *b*, however, would not endanger the corner.

Dia. 6. When White has made the diagonal connection, on the other hand, the marked black stone threatens to kill him. This time, however, Black *a* would not affect the corner, and White can answer Black *b* by playing *c*. Thus White should make the diagonal connection when he wants to keep the lower edge open, and should make the solid connection when he wants to keep the right edge open.

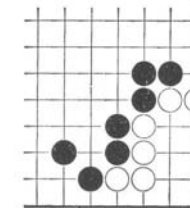
Problems



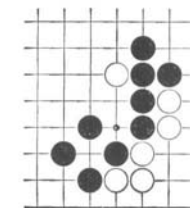
1. Black to make a ko

2. Status?

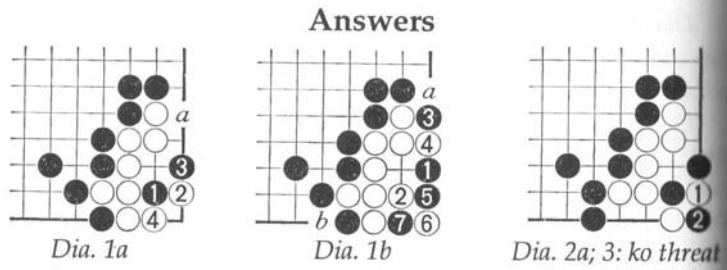
3. Black to kill



4. Status?



5. Black to make a ko



1. Direct ko

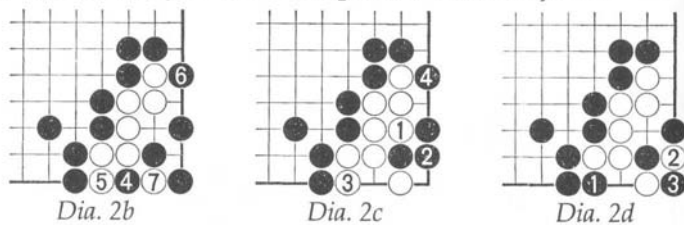
Dia. 1a. Black 1 at the two-two point leads to a direct ko. Note that Black cannot play 3 at 4; White would answer at *a* and live unconditionally.

Dia. 1b. Black can also reach a ko by attacking this way — White must play 6 to avoid a bent four in the corner — but after Black 7, White will capture at *a* and *b*, and the ko will become very indirect for Black.

2. White can make a two-stage ko. Black can make a direct ko.

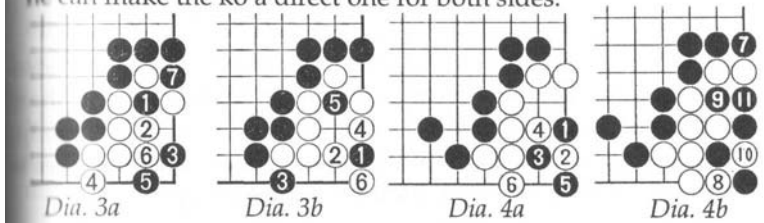
Dia. 2a. This position is a little bizarre; it is a ko no matter who plays next. If White starts the ko, it is a two-stage ko which he can win by ignoring just one ko threat, while Black must ignore two.

Dia. 2b. Ignoring White 3, Black can move from stage one to stage two, but he will have to ignore a second white ko threat to complete the capture. In stage two of the ko fight, White is two moves away from winning it and Black only one.



Dia. 2c. White cannot live this way because of his shortage of liberties.

Dia. 2d. If White ignores the situation and Black moves next, he can make the ko a direct one for both sides.



3. Throw-in

Dia. 3a. The throw-in at 1 and placement at 3 are the killing combination. Continued resistance by White only leads to a bent four.

Dia. 3b. If Black attacks at 1 without making the throw-in, White can live by playing 2. If Black plays 1 at 3, White can live by answering at 1.

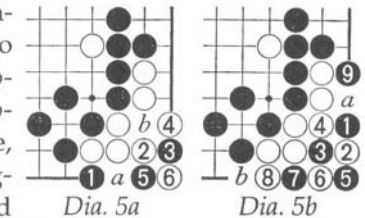
4. White is mostly alive.

Dia. 4a. Black's best attack is the eye-stealing tesuji at 1, but White defends with 2, 4, and 6.

Dia. 4b. Continuing, Black can capture two stones in gote, but the main part of White's group lives.

5. Two-step ko

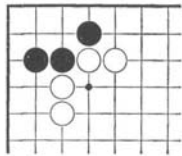
Dia. 5a. The L+2 group with a weak leg is not unconditionally alive; Black can make a ko by attacking with 1 and 3, trapping White in a shortage of liberties. The ko is a two-step one, however. Black will have to ignore two ko threats to play *a* and *b*.



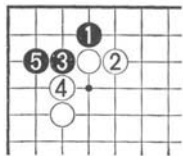
Dia. 5b. This attack also ends in a two-step ko. White cannot play 10 at *a* due to his shortage of liberties, but Black will have to play both *a* and *b* to win the ko fight.

24. THE TRIPOD GROUP

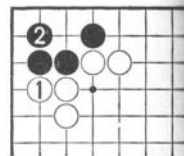
Dia. 1. Just as three is the minimum number of legs needed to keep a stool or other piece of equipment standing up, so three is the minimum number of stones needed to make a live group. Few groups actually attain the minimum, but one that does is shown in *Dia. 1*. We shall call it the tripod group.



Dia. 1



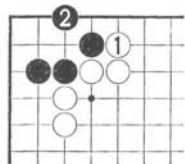
Dia. 2



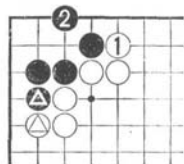
Dia. 3

Dia. 2. The tripod group often arises from a probe at 1 against a corner enclosure. If White answers at 2, Black can live with 3 and 5 — not necessarily at once, but when the time becomes ripe.

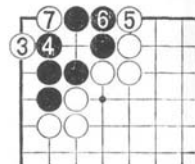
Dia. 3. If White attacks the tripod group from its strong side, Black answers at 2. It should be obvious that he is then alive.



Dia. 4



Dia. 5



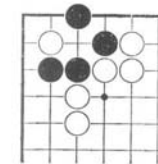
Dia. 6

Dia. 4. If White attacks the tripod group from its weak side, Black should make the diagonal connection at 2. It may be less obvious that he is alive now, but the details will be worked out in the problems below.

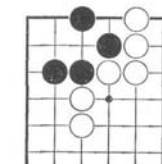
Dia. 5. The most important thing to keep in mind about the tripod group is not to make the exchange of the marked black stone for the white one. If Black does this, he is no longer unconditionally alive. White attacks at 1.

Dia. 6. Continuing, White's placement at 3 forces a ko. Variations of this sequence will come up in problems 3 and 6.

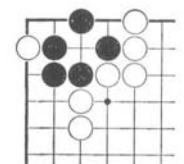
Problems



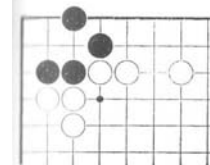
1. Black to live



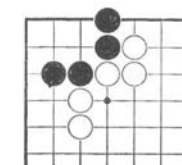
2. Black to live



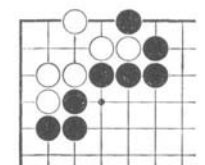
3. Black to live



4. Status?

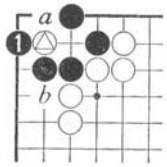


5. Status?

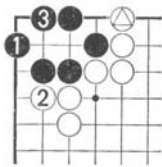


6. Status?

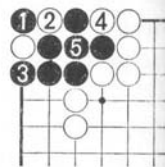
Answers



Dia. 1



Dia. 2



Dia. 3a

1. Hane

Dia. 1. Black's hane at 1 makes *a* and *b* miai. Assuming White *b*, Black *a*, we see that if White plays the marked stone, Black gets four points of territory.

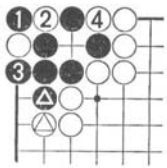
2. The same defense

Dia. 2. Now White has played the marked stone in a different place, but Black 1 is the same defense as before, making 2 and 3 miai. This is a better sequence for White, since it leaves Black with only two points of territory.

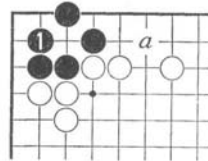
3. Squeeze

Dia. 3a. The trick is for Black to make a kind of throw-in at 1. When White captures at 2, Black squeezes him from the outside at 3 to make two eyes. When White gives atari at 4, (whether before or after White 2), Black connects at 5.

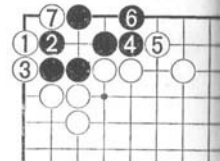
Dia. 3b. Note that this sequence does not work if Black has made the marked exchange. After White 4, Black cannot connect, due to a shortage of liberties caused by the empty triangle at 3 and his marked stone. He has to play 5 at 1 and let White start a ko.



Dia. 3b



Dia. 4a

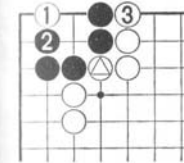


Dia. 4b

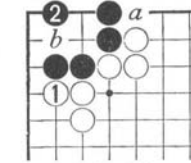
4. Black can live. White can make a ko.

Dia. 4a. Black can easily live. Perhaps Black 1 is the best way, since it enables Black next to jump out to *a*.

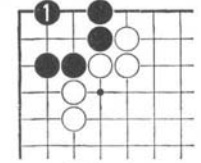
Dia. 4b. White can cause a ko with 1. If Black plays 2 at 3, White 3 at 2 kills him. White must not play 1 at 2, however, or Black will answer at 1 and be alive.



Dia. 5a



Dia. 5b



Dia. 5c

5. Black can live. White can kill.

Dia. 5a. The one-two point is very much the key to this problem. If White attacks there, (the eye-stealing tesuji with respect to the marked white stone), Black is dead.

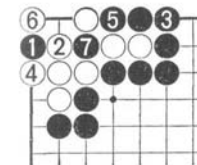
Dia. 5b. But if White attacks from the outside, at 1 or at *a*, Black can live by playing 2, (the eye-protecting tesuji). Or if White attacks at *b*, again Black can live by playing 2.

Dia. 5c. If it is Black's turn to go first, 1 is his best way to live.

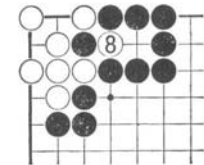
6. White is alive.

Dia. 6a. Black 1 and 3 are the familiar attacking combination, but now White has a defense. Playing 4 and 6, he lets Black capture two stones.

Dia. 6b. Then he recaptures, making two sound eyes.

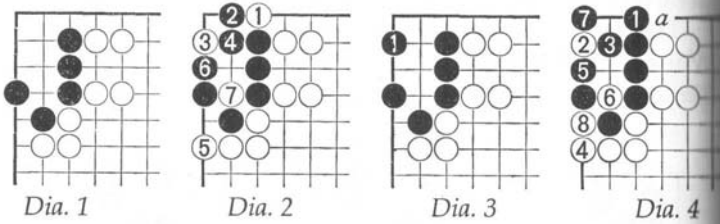


Dia. 6a



Dia. 6b

25. THE J GROUPS



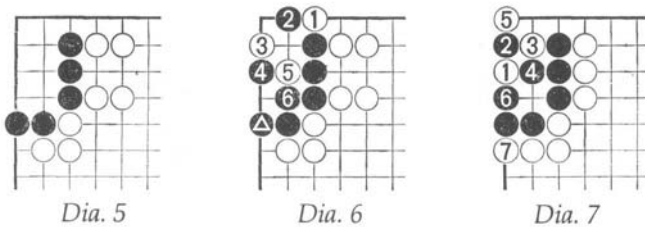
Dia. 1. The (regular) J group pictured here is the same as the second L+1 group, except that Black has made a diagonal connection instead of a solid one, and like that group, it lives or dies according to sente.

Dia. 2. White can kill the J group with the hane at 1, placement at 3, descent to 5, and throw-in at 7. The order of White 1 and 3 may be reversed.

Dia. 3. Black can live by playing 1, which gives him six points of territory.

Dia. 4. Black can also live by descending to 1 as shown here, when that might help him on the outside, but then White can reduce his corner to a net two points with the sequence from 2 to 8. White 8 is only an endgame move, (four points in gote), but it is important that White can play 4 in sente in this diagram, whereas he could not do so in *Dia. 3*.

Even more surprisingly, Black can live by playing 1 at *a*, as in problem 1.



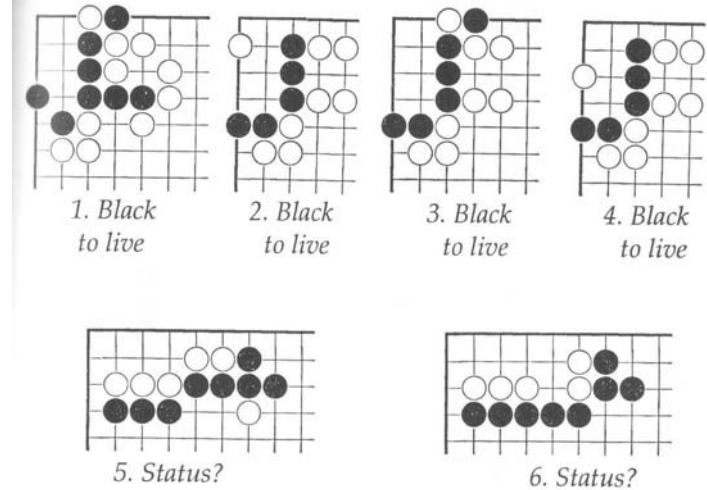
Dia. 5. This is the straight J group, in which Black has descended straight to the edge instead of making a diagonal connection. The straight J group is stronger than the regular one, and now the best that White can get is a ko. There are various ways for him to attack.

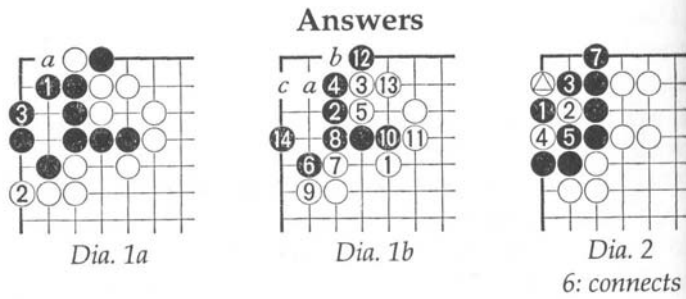
Dia. 6. White can use the same 1-3 combination as in *Dia. 2*, but now the marked black stone comes to be better placed, and a ko is the result. The order of White 1 and 3 is no longer reversible (problem 2). As one might expect, this attack fails when there is a black hane on the upper side (problem 3).

Dia. 7. When Black has no outside liberties, White has another good attack in the eye-stealing tesuji at 1. Comparing *Dias. 6* and *7*, in *Dia. 6* White gets to make the first ko capture, but if he wins the ko in *Dia. 7*, he actually removes part of Black's group from the board, so each attack has its advantage.

White can also get a ko by playing 1 at 3 in *Dia. 7*, although that move has no special merit.

Problems





1. Turn in

Dia. 1a. Instead of capturing the white stone with *a*, Black turns in at 1. White cannot come down to *a* because of the black stone behind him, and if he descends to 2, Black lives with 3.

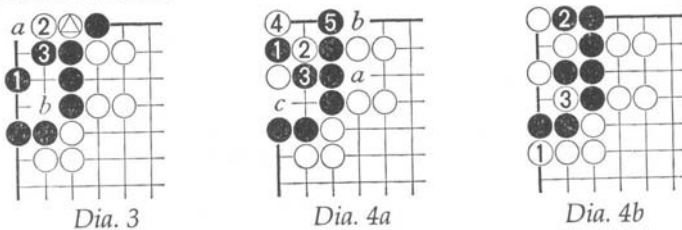
Dia. 1b. This position arises when Black ignores a double approach against a handicap stone and White closes him in at 1. Black can live in the corner with 2 to 14, ready to answer at *a* if White attacks at either *b* or *c*.

2. Squeeze

Dia. 2. White has attacked incorrectly with the marked stone without first making a hane at 7. It is an easy matter for Black to live by squeezing him with 3 and 5, then descending to 7.

3. Eye-protecting tesuji

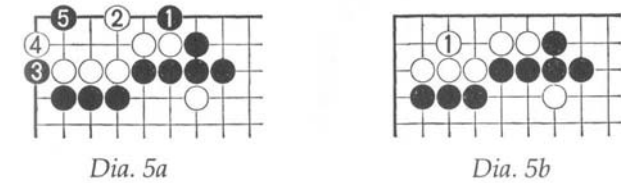
Dia. 3. Black plays the eye-protecting tesuji at 1, and Black 3 makes *a* and *b* miai. In this position White should have attacked with the marked stone at 1; Black could still have lived, but White could have gotten more out of the attack, as the next problem shows.



4. Descent

Dia. 4a. After 1 to 4, Black descends to 5. If it were not for the liberty at *a*, White would play *b* and force him to fight a ko with *c*, but as the position stands, he is alive.

Dia. 4b. In the endgame, White can capture two stones with 1, but be careful — this move is gote. Black 2 and White 3 can follow in either order.



5. White can live. Black can kill.

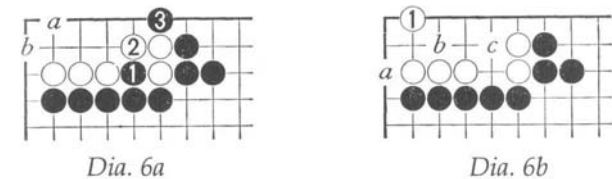
Dia. 5a. Black starts with the hane at 1. If White connects diagonally, he has the J group, which Black can kill with 3 and 5. If White made a solid connection, he would have the second L+1 group, which Black could likewise kill.

Dia. 5b. White 1 is a good way to live.

6. White can live. Black can kill.

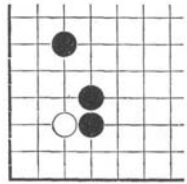
Dia. 6a. Black 1 and 3 reduce this to the previous problem. If White plays 2 at *a*, Black answers at *b*.

Dia. 6b. White 1, which keeps *a* from being Black's sente, is the proper way to live here. To see why White plays 1 instead of *b*, consider a black attack at *c*.

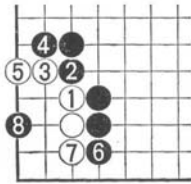


26. HANE FOR KO

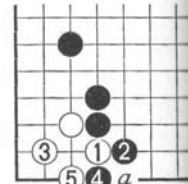
This section looks at some typical corner positions that become ko, and at some similar ones that do not become ko.



Dia. 1



Dia. 2

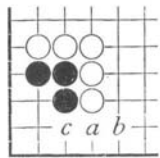


Dia. 3

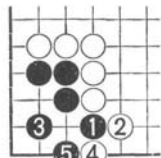
Dia. 1. White has just invaded at the three-three point, but unless he has some other stones nearby, the best he can hope for is a ko. How he makes the ko is important.

Dia. 2. If he expands upward with 1 to 5, Black can descend to 6, forcing White to make the straight J group, then attack at 8. This yields a comparatively poor ko for White, and things might go still worse for him if Black played 6 at 8.

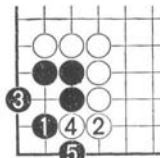
Dia. 3. The correct way for White to reach a ko is with the hane at 1 and diagonal connection at 3. Now if he wins the ko and captures at *a*, he is in a position to devastate whatever territory Black may have had on the lower side.



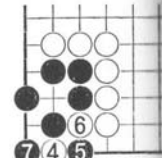
Dia. 4



Dia. 5



Dia. 6



Dia. 7

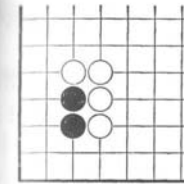
Dia. 4. This is a related shape. At first glance it looks as if Black cannot live unconditionally: Black *a*, White *b*, Black *c*, and he has the first L+1 group, for example.

Dia. 5. Accordingly, he may play for a ko with the hane and diagonal connection shown here. When he is well endowed with ko threats, this ko is fairly attractive; if he wins it, his group will become active on the lower side. White, however, is likely to play 2 differently than shown, and the ko may not be had so easily; see problem 4.

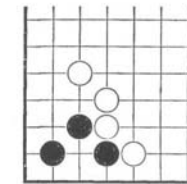
Dia. 6. Fortunately, Black can get a small but unconditional life by making the diagonal play at 1 without the hane. If White plays 2 at 3, Black plays 3 at 2 and again lives unconditionally.

Dia. 7. White 4 here also fails to kill Black.

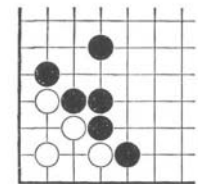
Problems



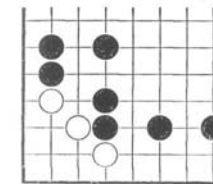
1. Status?



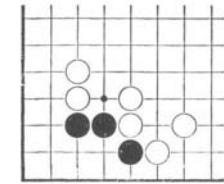
2. White to kill



3. Status?



4. Black to kill



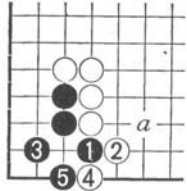
5. Black to live

Answers

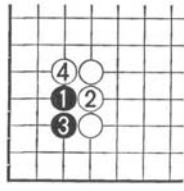
1. Black can make a ko. White can kill.

Dia. 1a. Black 1, 3, and 5 are the familiar ko pattern. Depending on the ko threat situation and on what he stands to lose on the lower side, White may prefer to omit 4, or to play it at *a*.

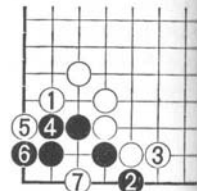
Dia. 1b. This position arises when Black probes under a white corner enclosure, as shown.



Dia. 1a



Dia. 1b



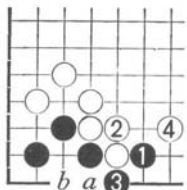
Dia. 2a

2. Diagonal play

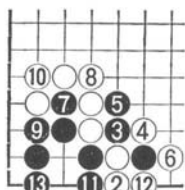
Dia. 2a. White can kill Black unconditionally with the diagonal play at 1. Black 2 etc. are futile.

Dia. 2b. It should be pointed out, however, that Black has the clamp at 1, (or the cut at 2), to aim at. If White answers 1 at *a*, Black will play *b* and start a ko.

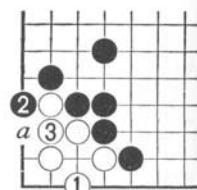
Dia. 2c. Another interesting possibility: if White descends with 2 instead of connecting as in *Dia. 2b*, and plays 4 and 6, the corner springs back to life.



Dia. 2b



Dia. 2c



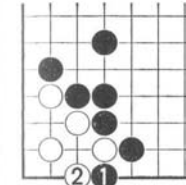
Dia. 3a

3. White can live. Black can make a ko.

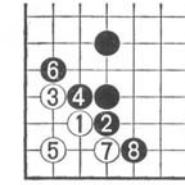
Dia. 3a. White can live unconditionally by playing 1 or *a*.

Dia. 3b. Black cannot kill White unconditionally, but must settle for a ko.

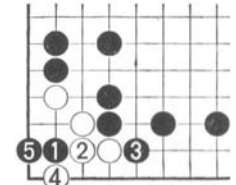
Dia. 3c. Here is how the position arises. The advantage to Black in playing 4 and 6 is that if White goes on to live as in *Dia. 3a*, he gets only a small life. The disadvantage is that White can leave the corner as it is and still have a ko.



Dia. 3b



Dia. 3c

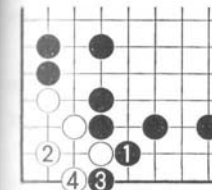


Dia. 4a

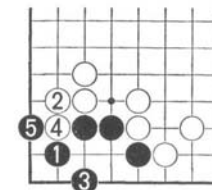
4. Placement

Dia. 4a. Black's placement at 1 takes the key point, and the rest is routine. If White plays 2 at 3, Black cuts at 2.

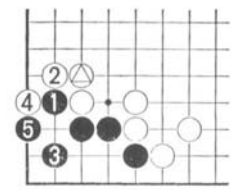
Dia. 4b. If Black blocks from the outside with 1, White has a ko.



Dia. 4b



Dia. 5a



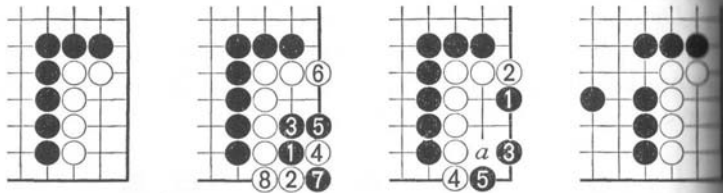
Dia. 5b

5. Diagonal play

Dia. 5a. Black's diagonal play into the corner at 1 gives him an unconditional life. Black 3 is the key tesuji.

Dia. 5b. The ko is not quite so attractive here because White's position is strengthened by the marked stone.

27. THE LONG L GROUP



Dia. 1

Dia. 2

Dia. 3

Dia. 4

Dia. 1. The long L group is one line longer and a good deal stronger than the normal L group. It is nearly alive; if Black attacks it, all he can get is an indirect ko.

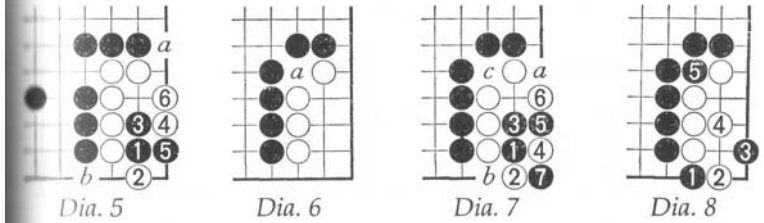
Dia. 2. Black's usual attack is the belly play at 1, which leads, as shown, to a thousand-year ko. Black has to make three approach moves before he can put White into atari, while White has to make one approach move before he can put Black into atari, so the likely result is that both players will refuse to touch the position, and eventually Black will connect at 4 to make a seki. White will have to be careful to keep an adequate supply of ko threats, however, when he starts to lose his outside liberties.

Dia. 3. This attack also achieves an indirect ko — next White plays *a* — but a little thought will show that *Dia. 2* is better for Black.

Dia. 4. When the long L group has an outside liberty, it is unconditionally alive.

Dia. 5. (next page) Black attacks with 1 and 3 again, but this time White plays 4 differently, and Black has to settle for a seki. If he plays 5 at 6, White lives with territory, (problem 1). Note that *a* and *b* are Black's sente.

Dia. 6. Without the stone at *a*, the long L group is much weaker.



Dia. 5

Dia. 6

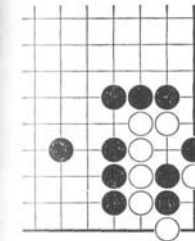
Dia. 7

Dia. 8

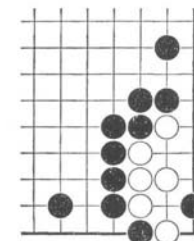
Dia. 7. Black 1 and 3, for example, now produce a direct ko. If White plays 6 at *a*, then Black 7, White *b*, Black *c*, and White has an unfavorable two-step ko.

Dia. 8. But Black has an even stronger attack in the series of tesuji shown here (problems 2 and 3).

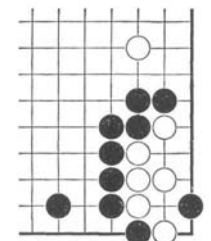
Problems



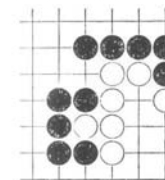
1. White to live



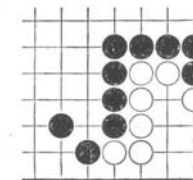
2. Status?



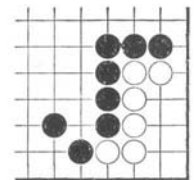
3. Status?



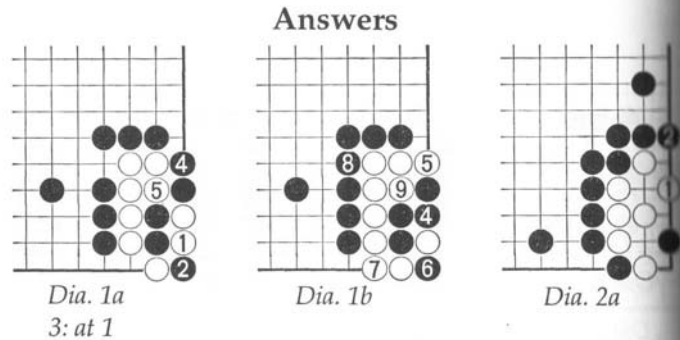
4. Black to kill



5. Black to make a ko



6. Status?



1. *Suicidal*

Dia. 1a. White 1 looks suicidal, but White recaptures at 3 and has Black caught in a shortage of liberties if he tries to escape.

Dia. 1b. Black 4 here does not work either.

2. *White is dead*

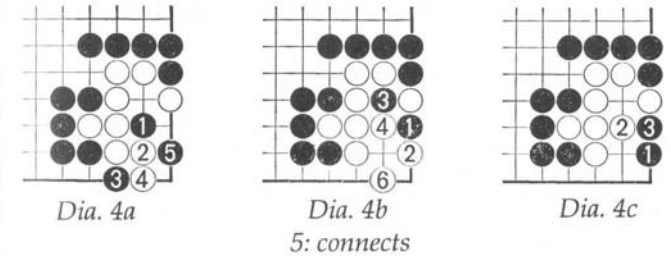
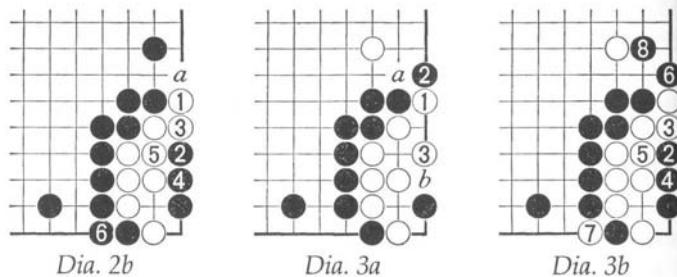
Dia. 2a. White 1 clearly fails.

Dia. 2b. This hane is more resourceful — if Black answers at *a*, White 2 creates a ko — but Black 2, 4, and 6 leave White dead.

3. *White can make an unfavorable two-step ko. Black can kill.*

Dia. 3a. This time Black must play 2 and settle for a ko, but the ko is favorable to him. White has to make an extra move at *a* (or, alternatively, *b*) to win it.

Dia. 3b. If Black tries to kill the corner unconditionally, he ends up with a gote seki.



4. *Belly play*

Dia. 4a. If Black finds the belly play at 1, White is dead.

Dia. 4b. But if Black makes the mistake of giving atari with 1, White replies with the counter-atari at 2 and lives.

Dia. 4c. And the placement attack leads to a ko.

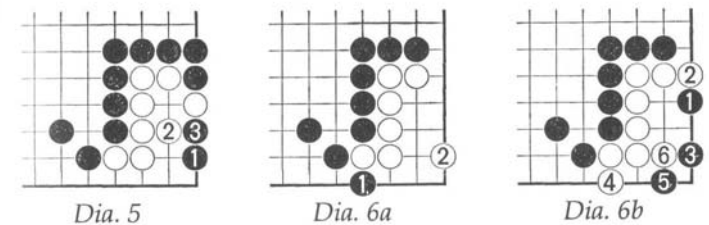
5. *Placement*

Dia. 5. Now the placement is correct; Black 1 at 2 would fail completely. If White plays 2 at 3, then Black gives atari at 2 and White dies.

6. *White is alive.*

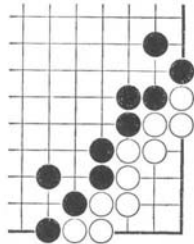
Dia. 6a. The long L group with one leg is alive. If Black hanes at 1, White should defend at 2, the key point in this shape.

Dia. 6b. White no longer has anything to fear from Black 1 and 3. He has enough outside liberties to capture the invading stones, and even if he chooses not to capture them, the corner only becomes a seki.

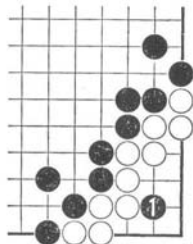


28. SEKI IN THE CORNER

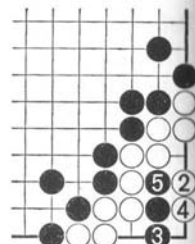
There are many groups in the corner that are alive but that the enemy can invade and turn to seki. They are not usually thought of as providing life-and-death problems, but they do: the problem is for the invader to live inside his opponent's group.



Dia. 1



Dia. 2

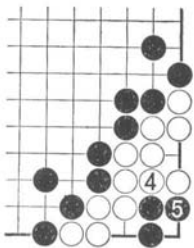


Dia. 3

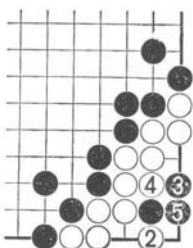
Dia. 1. This is the L+2 group after White has hane and connected on both sides. Doing so has not strengthened his shape; rather, it has weakened it, creating a shortage of liberties and inviting the following invasion.

Dia. 2. Black invades at the two-two point.

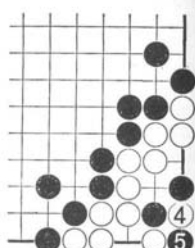
Dia. 3. If White replies at 2, Black descends to 3. White 4 and Black 5 then produce a seki.



Dia. 4



Dia. 5



Dia. 6

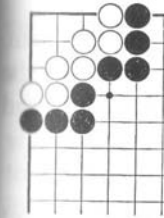
Dia. 4. White 4 and Black 5 can be played the other way around, again producing a seki.

Dia. 5. There are lots of variations. White can hane underneath Black's invading stone with 2. Black will make the diagonal extension to 3, and White 4 will again cause a seki.

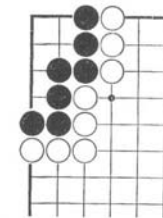
Dia. 6. If White cannot afford to allow the seki, he can play 4 here and start a two-stage ko fight. In general, however, this ko would be an even bigger success for Black than the seki.

In several of the problems below, the defender can choose between ko and seki. These ko options are noted in the answers, but when solving the problems, except for problem 5, assume that the defender will avoid ko and try to determine whether the attacker reaches seki in sente or in gote.

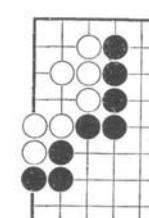
Problems



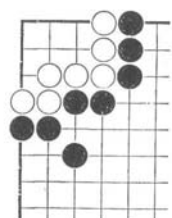
1. Black to play



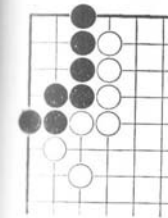
2. White to play



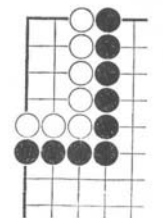
3. Black to play



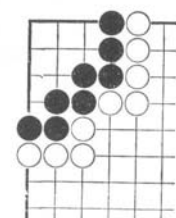
4. Black to play



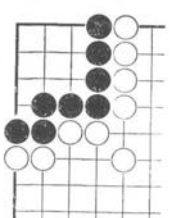
5. White to play



6. Black to play

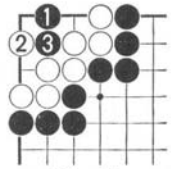


7. White to play

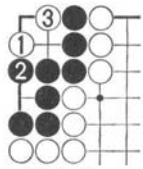


8. White to play

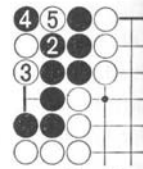
Answers



Dia. 1



Dia. 2a



Dia. 2b

1. Gote seki

Dia. 1. Black can begin at either 1, 2, or 3. The result is always the same.

2. Gote seki or ko

Dia. 2a. This is a seki in which both sides have an eye.

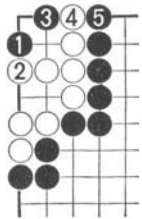
Dia. 2b. Black can play for a ko, but the ko is direct and he has to find the first ko threat.

3. Gote seki

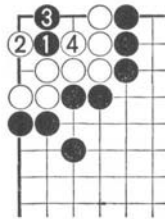
Dia. 3. This is the same pattern as in the previous problem. If, after Black 5, White captures the two enemy stones in the corner, he loses three of his own stones in the process, so he had best leave the position as a seki.

4. Sente seki

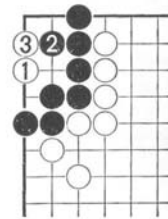
Dia. 4. White 2 and Black 3 are miai in this diagram, and could be played the other way around.



Dia. 3



Dia. 4



Dia. 5

5. Thousand-year ko

Dia. 5. From White 3 the position can develop into either a

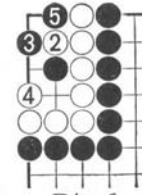
seki or a thousand-year ko. Whoever starts the ko will have to make an approach move next to White 1.



Dia. 6a



Dia. 6b



Dia. 6c

6. Sente seki or indirect ko

Dia. 6a. Black 1 is the best invasion point, and White 2 is the best reply. The safe sequence from 3 to 6 sees Black getting a sente seki.

Dia. 6b. White can play 4 here, but he risks being killed in a thousand-year ko.

Dia. 6c. White 2 in this diagram also risks a ko fight, in this case a two-step ko.

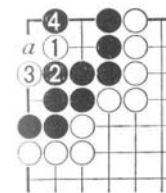
7. Sente seki, but . . .

Dia. 7. There are various ways to answer White 1, but the way shown has the advantage that White may eventually have to connect at *a*, in gote, to keep Black from regaining his territory in a ko. If White plays 3 at *a*, allowing Black 3, he definitely ends in gote.

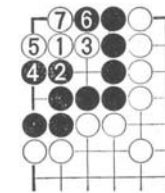
8. Gote seki or ko

Dia. 8a. White 1 and 3 are the key plays for making the seki.

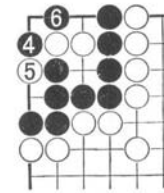
Dia. 8b. Black 4 and 6 in this diagram can be used to get a ko.



Dia. 7



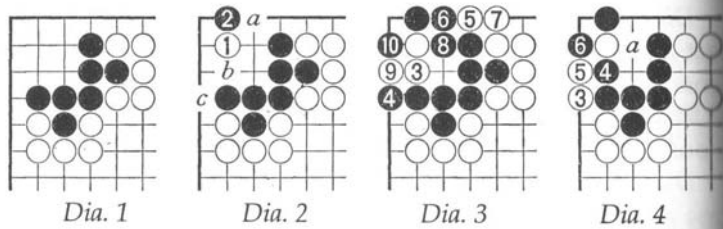
Dia. 8a



Dia. 8b

29. THE CARPENTER'S SQUARE

Dia. 1. The carpenter's square is by far the most difficult of all corner formations. Generally speaking, if White attacks it he can force a ko, but there are a seemingly endless number of ways to do so, only some of which will be shown here. There is a saying to the effect that 'anyone who completely understands the carpenter's square must be at least an (amateur) shodan,' but 'professional 9-dan' might be closer to the truth.



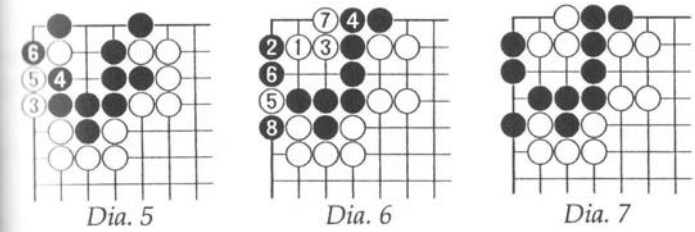
Dia. 2. The correct way to attack the carpenter's square is at the two-two point, with White 1. Black's best response is 2, to which White must not answer *a* (problem 1). Instead, White should answer from the other direction, at *b* or *c*.

Dia. 3. Extending downward with 3, White gains a direct ko. This sequence would not work, however, if Black had an extra outside liberty. (Why?)

Dia. 4. When Black has outside liberties, White simply takes another road to ko. Black must not shift 4 to 5 in this sequence, or White will play *a* in sente, then 4, and kill Black unconditionally.

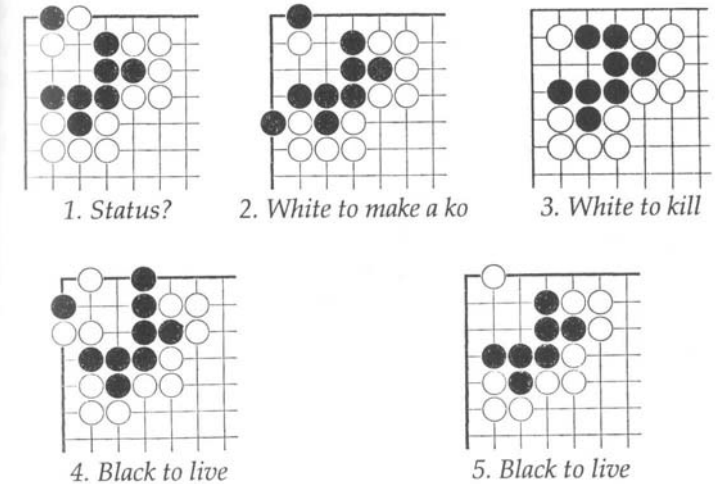
Dia. 5. (next page) White 3 and 5 are also useful when Black has a hane on the upper edge, instead of an outside liberty.

Dia. 6. If Black has both a hane and an outside liberty, his position improves considerably. He should play 2 on the side away from the hane. Now White can get only a very indirect ko with 3, 5, and 7.

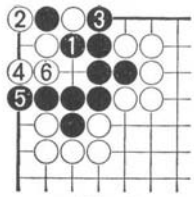


Dia. 7. In the position resulting from *Dia. 6*, neither player has a strong incentive to make the next move. Black is in no immediate danger of dying, because to capture him, White would have to ignore four ko threats. For his part, Black would have to ignore one ko threat to capture the white invaders, and would gain only seven points of territory. If Black loses one of his outside liberties, the position becomes a thousand-year ko, and may end up as a seki.

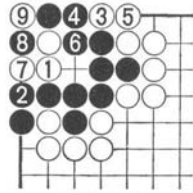
Problems



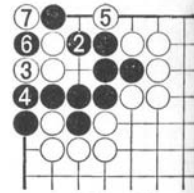
Answers



Dia. 1



Dia. 2a



Dia. 2b

1. Black can make an indirect ko. White can kill.

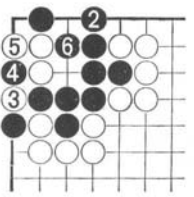
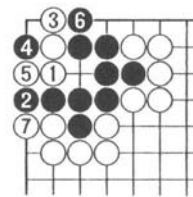
Dia. 1. This sequence is more or less automatic; the main difficulty is in analyzing the result. For Black it is a two-stage ko — he will have to ignore two ko threats to win it. White's position is even worse, however: because of Black's internal and external liberties, he is faced with a three-step ko. The ko is thus indirect for both sides, but it must be resolved eventually, since there is no way it can become a seki.

2. Extend toward the hane.

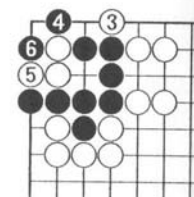
Dia. 2a. White should extend toward Black's hane with 1. Black 2 may seem unnecessary, but Black has no better move, and the result is a direct ko.

Dia. 2b. If Black plays 2 here, White 3 forces the same direct ko.

Dia. 2c. Here is a third way for Black to play 2. The result is still a direct ko.

Dia. 2c
7: at 3

Dia. 3a

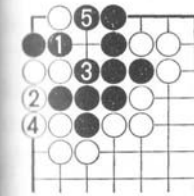


Dia. 3b

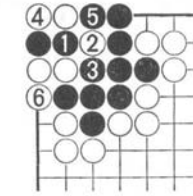
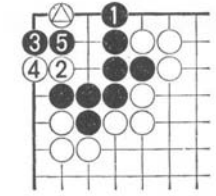
3. Shortage of liberties

Dia. 3a. White 1 and 3 are the killing moves. Black dies, as in problem 1 in section 8, because he does not have enough liberties to capture the four white stones.

Dia. 3b. If Black had an outside liberty, White would have to play 3 this way, leading to a ko.



Dia. 4a

Dia. 4b
7: at 1

Dia. 5

4. Push through

Dia. 4a. Black must push through at 1. If White links up at 2, Black 3 and 5 form two eyes. Black must not try to stop White from linking up by playing 1 at 2, or White 2 at 1 will kill him.

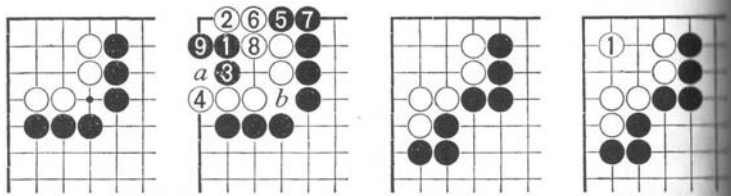
Dia. 4b. What if White resists by playing 2 here? The sequence is longer, but the end result is the same. After Black captures with 7 at 1, White cannot connect to the left of 1 because of a shortage of liberties.

5. Descend

Dia. 5. Black descends to 1. White 2 is a tesuji, but Black 3 is a counter-tesuji, and White 4 and Black 5 reduce this to the previous problem. White can play 4 at 5, but then Black 5 at 4 makes a seki.

Problems 4 and 5 constitute a famous life-and-death problem. White's attack with the marked stone in *Dia. 5* is not really a good move, but the answering tesujis at 1, 3, and 5 are very hard to find, and if Black misses any of them, he dies unconditionally.

30. THE WEAK CARPENTER'S SQUARE



Dia. 1

Dia. 2

Dia. 3

Dia. 4

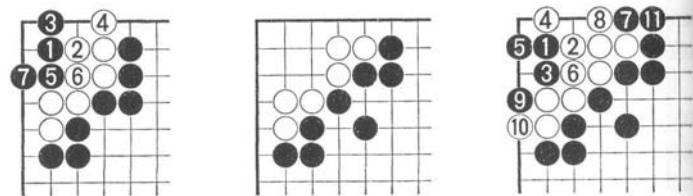
Dia. 1. Without its corner stone, the carpenter's square is much weaker than before. If Black attacks, the result is not a ko, but White's unconditional death.

Dia. 2. Against Black 1, White tries his tesuji at 2, but Black 9 kills him unconditionally by making *a* and *b* miai. This sequence works no matter how many outside liberties White has. Other White 2's are explored in the problems, but they all end the same way.

Matters are not so simple when White has one or two hanes in place, but let's skip the ghastly details and go on to some other shapes.

Dia. 3. This position is fairly common. White lives or dies according to sente.

Dia. 4. White 1 at the two-two point, (the eye-protecting tesuji), makes a strong, living shape.



Dia. 5

Dia. 6

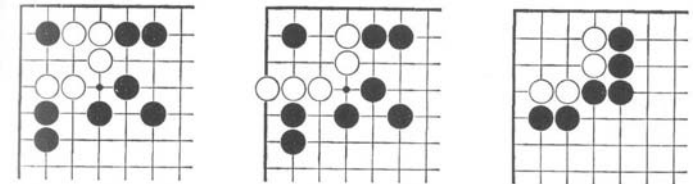
Dia. 7

Dia. 5. But Black 1 at the two-two point, (the eye-stealing tesuji), is fatal. White has to play 2 and 4 to keep Black from linking up to the right. Black plays 5 to destroy White's eye and 7 to make an eye for himself, and this kills White. Black can just as well play 3 at 5 in this sequence; he need not fear White's answering at 3, (problem 4).

Dia. 6. Even with two legs, White is not completely safe. Black can eke out a two-step ko.

Dia. 7. Again Black attacks at the two-two point. Black 3 keeps White from making an eye at 6, and although White 4 makes an eye on the upper edge, Black 5 threatens 6 and brings about a two-step ko, (favorable to White). There is a good reason why Black exchanges 7 for 8 before playing 9 in this sequence (problem 5).

Problems



1. Black to kill

2. Black to kill

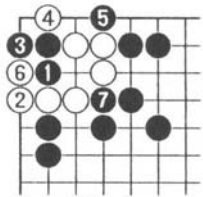
3. Status?



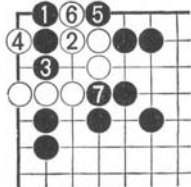
4. Black to kill

5. Status?

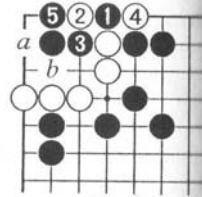
Answers



Dia. 1



Dia. 2a



Dia. 2b

1. White dies.

Dia. 1. Black 1 to 7 is one killing sequence. There are several possible variations, including Black 3 at 4 or 5, and Black 1 at 2.

2. Two ways

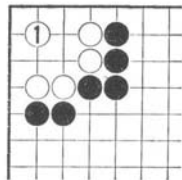
Dia. 2a. One way for Black to kill White is to descend to 1. Black 3 stops White's eye and threatens a pyramidal four. White 4 stops that, but Black 5 and 7 leave White dead.

Dia. 2b. Another move that works is the hane at Black 1. After Black 5, the points at *a* and *b* are miai. White is unconditionally dead, regardless of whether or not he connects at 1.

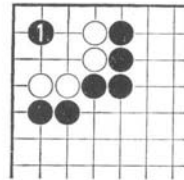
3. White can live. Black can kill.

Dia. 3a. It should be very easy to see that when White plays 1, he is alive.

Dia. 3b. And if Black plays 1, White is just as obviously dead. White's group in this problem thus has the same status as if it had a leg on one side.



Dia. 3a

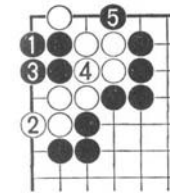


Dia. 3b

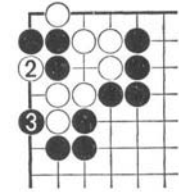
4. One-two point

Dia. 4a. Black has to play 1 at the one-two point or else White will play there and cause a ko. White tries for a ko anyway by descending to 2, but Black 3 foils him, making 4 and 5 miai.

Dia. 4b. White 2 here is simply answered by Black 3, and again the ko fails to materialize.



Dia. 4a

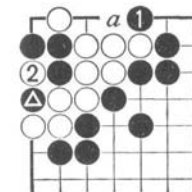


Dia. 4b

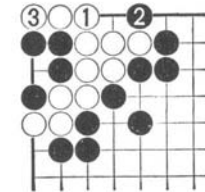
5. White can live. Black can make an unfavorable two-step ko.

Dia. 5a. When Black hanes at 1, White does not answer at *a*, but starts in immediately on the ko. The ko is still a two-step one, but White can now play *a* as a ko threat. That is the penalty Black pays for missing the correct sequence and playing the marked stone before 1.

Dia. 5b. Given the chance, White lives unconditionally by squeezing Black with 1 and 3.



Dia. 5a



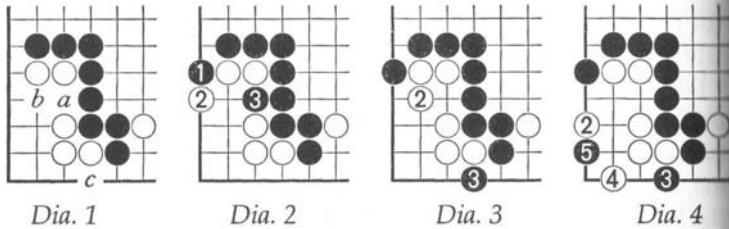
Dia. 5b

31. MORE CORNER POSITIONS

There are many corner positions that we have not covered yet. Here are two examples and six problems.

Dia. 1. This position turns up in handicap joseki when White invades at the three-three point after making an outside approach. He needs to add a stone at *a*, making the long L group with one leg. If he does not, Black can kill him.

The question is how to kill White. Black *a*, White *b* makes the L+2 group with a weak leg, yielding only an indirect ko. Black *b*, White *a* is even worse — White lives unconditionally, as you may figure out for yourself. Black *c*, White *a* gives White the nearly alive long L group. What is Black supposed to do?



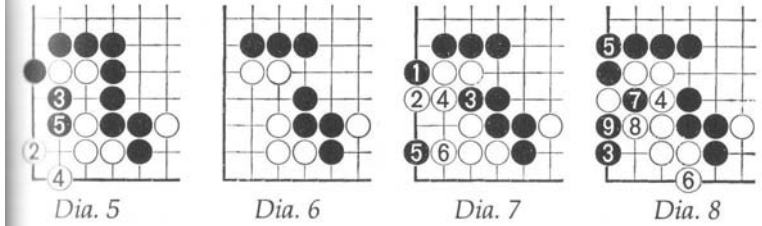
Dia. 2. The killing move is the hane at 1. White cannot answer at 2 because of Black 3.

Dia. 3. White 2 here is no good either. White has the first L+1 shape, and the hane at 3 kills him.

Dia. 4. Perhaps White will drop back a step to 2 in this diagram, but again the hane at 3 kills him.

Dia. 5. (next page) Dropping even farther back to the one-two point is a desperation measure that fails. When Black plays 5, White has no defense.

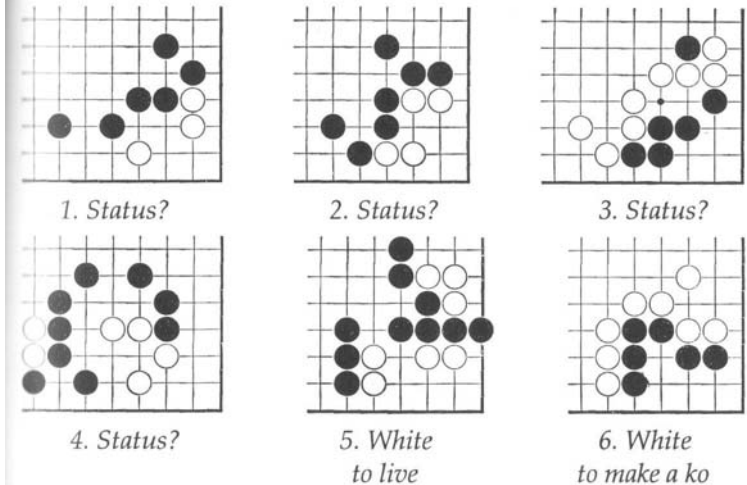
Dia. 6. This is the same position, except that now White has a liberty that he lacked before. Because of it, the best Black can do is to make a ko.



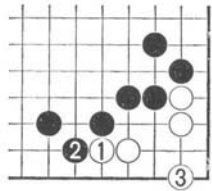
Dia. 7. Black attacks at 1 as before, but now White can answer by blocking at 2. Because of the liberty, Black 3 is no longer effective; in fact, it gives White an unconditional life, as you should verify.

Dia. 8. Black's correct move is the placement at 3, which leads to a direct ko. This sequence is worth studying; 4, 5, and 7 are all necessary. White 6, instead of 8, is an example of good technique. Win or lose the ko, White will be glad to have descended there.

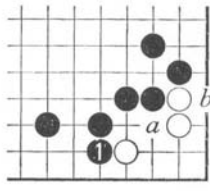
Problems



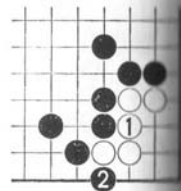
Answers



Dia. 1a



Dia. 1b



Dia. 2a

1. White can live. Black can kill.

Dia. 1a. Pushing out at 1 gives White enough room for two eyes. There are various choices for White 3.

Dia. 1b. All Black has to do to kill White is to block at 1. If White next plays a, for example, he has the L+1 shape, which Black b kills.

2. White is dead.

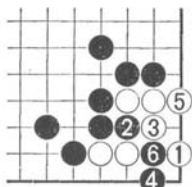
Dia. 2a. Connecting at 1 only makes the L+1 shape, so White cannot live this way.

Dia. 2b. Nor can White live by playing internally. White 1 at the one-two point looks promising, but Black 2, 4, and 6 put an end to White's hopes. Black 2 at 4 is also good.

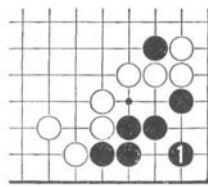
3. Black can live. White can kill.

Dia. 3a. Black needs to make a defensive play, and 1 is best.

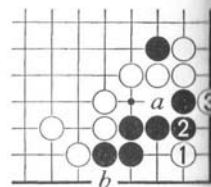
Dia. 3b. White can kill Black with the placement at 1, threatening to continue at 2 and link up. If Black blocks at 2, White 3 leaves him dead. Or if Black plays 2 at 3, then White 2, Black a, White b, and Black is dead.



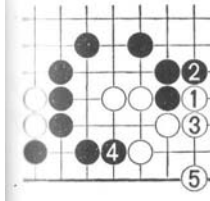
Dia. 2b



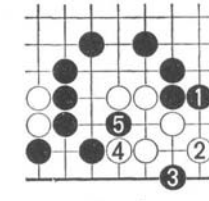
Dia. 3a



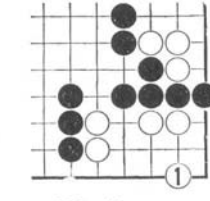
Dia. 3b



Dia. 4a



Dia. 4b



Dia. 5a

4. White can live. Black can kill.

Dia. 4a. White can live by playing 1 and 3, or in various other ways.

Dia. 4b. To kill the corner, Black descends to 1. The diagonal play at 2 is White's trickiest answer, but it does not work. After 5, White is dead.

5. One-two point

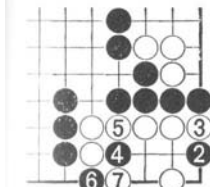
Dia. 5a. White lives unconditionally by playing at the one-two point.

Dia. 5b. Black 2, 4, and 6 are met by the throw-in at 7.

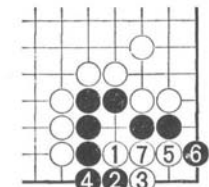
6. Four-stone pyramid

Dia. 6a. Black must answer at 2 when White plays 1, and then White can build a four-stone pyramid with 3, 5, and 7.

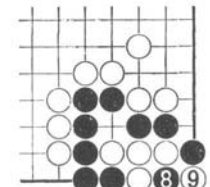
Dia. 6b. Next Black must make the throw-in at 8 and fight a ko. Note, however, that if he had one more outside liberty, he could squeeze White and the attack would fail.



Dia. 5b



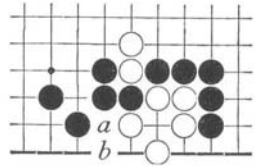
Dia. 6a



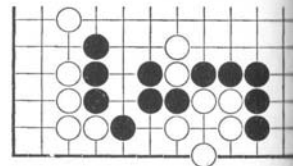
Dia. 6b

32. LIVE OR LINK UP

There are many times when a group that would be dead by itself can live by threatening to link up to an adjacent friendly group.



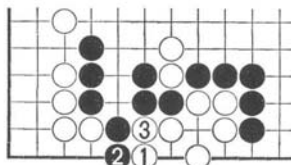
Dia. 1



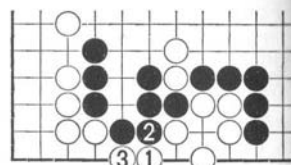
Dia. 2

Dia. 1. White's group on the lower edge, for example, cannot live independently. If White plays *a*, Black plays *b*, and vice versa.

Dia. 2. But add some more stones, as in this diagram, and the situation changes. No doubt you can see White's move easily.



Dia. 3

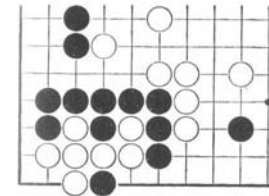


Dia. 4

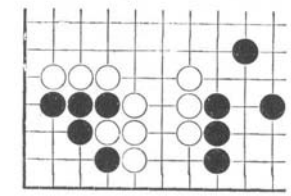
Dia. 3. White makes the diagonal play at 1. If Black blocks him at 2, he plays 3 and has two eyes.

Dia. 4. Or if Black plays 2 to squelch the second eye, White links up to the left. These two diagrams are the same as far as territory is concerned, but Black prefers *Dia. 4*, since it gives his own stones better eye shape. He should not play 2 immediately, however, but hold both possibilities in reserve.

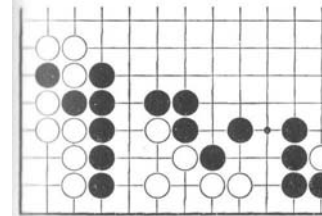
Problems



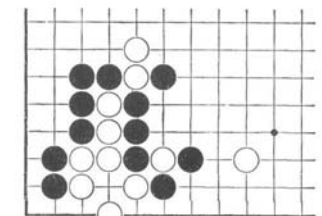
1. White to live



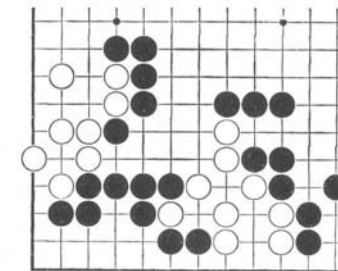
2. Black to live



3. Status?

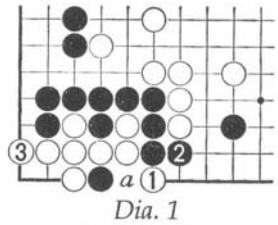


4. White to live

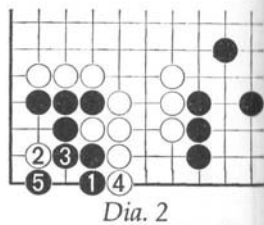


5. White to live

Answers



Dia. 1



Dia. 2

1. Hane

Dia. 1. White's hane at 1 threatens to link up at 2. If White played 3 without 1, then Black *a*, White 1, Black *a* would give him a false eye and, at the same time, prevent his linking up.

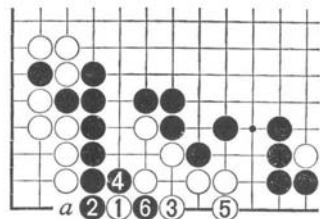
2. Descent

Dia. 2. Black lives unconditionally by descending to 1. White cannot spoil his eye shape with 2 because the connection at 3 makes 4 and 5 miai. Better would be White 2 at 4, Black 2, White 5 leading to a seki.

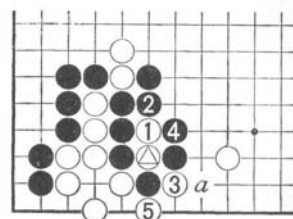
3. White can make a ko. Black can kill.

Dia. 3. White 1 to 5 create a ko. White 1 must come first; if White simply played 3, Black would reply at 1, threatening 6, and White would be dead.

If Black goes first, he can kill White most efficiently by making a hane at *a*.



Dia. 3

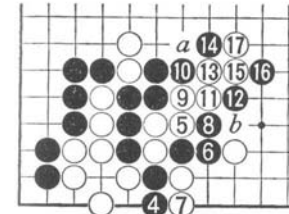


Dia. 4a

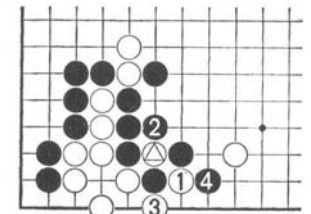
4. Two possible answers

Dia. 4a. There are two possible answers to this problem. In

the first one, the safe one, White 5 makes the recapture at the marked stone and the link-up at *a* miai, and White lives unconditionally.



Dia. 4b



Dia. 4c

5: takes ko at the marked stone

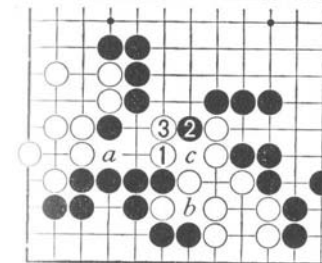
Dia. 4b. It does no good for Black to descend to 4. White replies with 5 and 7 and welcomes the ladder. He can run to his heart's content, then capture the two stones on the lower edge and have cutting points such as *a* and *b* to exploit.

Dia. 4c. In the second answer, White fights a ko. Assuming he can win it, this sequence has the advantage of not strengthening Black as much as did Dia. 4a.

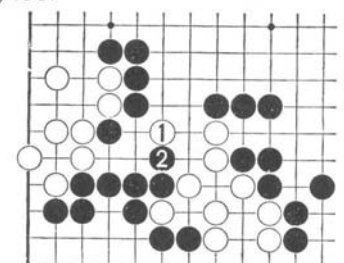
5. Diagonal move

Dia. 5a. White starts with the diagonal move at 1, and if Black answers at 2, White 3 makes *a* and *b* miai. If Black plays 2 at *b*, White still plays 3 and *a* and 2 become miai. If White played 1 at *b*, however, Black *c* would kill him.

Dia. 5b. And White 1 here fails, too.



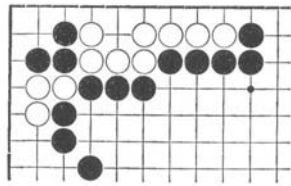
Dia. 5a



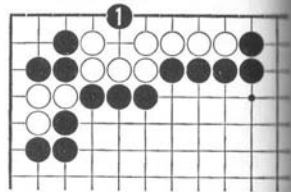
Dia. 5b

33. THREAT TO CAPTURE

Whereas the groups in the last section lived by threatening to link up with other groups, the groups in this section live by threatening to capture part of the stones that surround them.



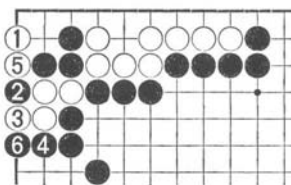
Dia. 1



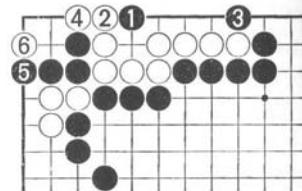
Dia. 2

Dia. 1. In this position, for example, White is alive as he stands. At first this seems to contradict his shape, a one-space notcher six lines long, which should be unsettled.

Dia. 2. And, indeed, if the position were altered only slightly, Black could kill White with 1.



Dia. 3

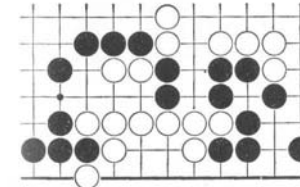


Dia. 4

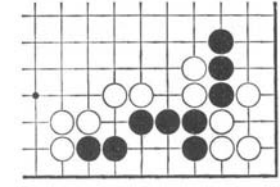
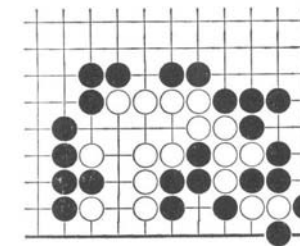
Dia. 3. Why, then, is White alive? He cannot capture the three black stones in the corner. Their three liberties are one better than the three liberties of the white stones below them, and if White attacks with 1, the usual tesuji in this shape, he loses. Then he does have to defend his group on the upper side.

Dia. 4. If he just leaves the position alone, however, he is safe. If Black tries to kill him with 1, White 2 threatens the balance in the corner, and if Black keeps on with 3, White 4 spells his downfall.

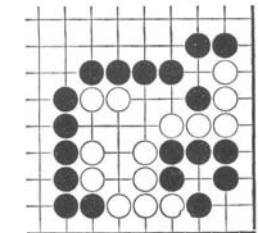
Problems



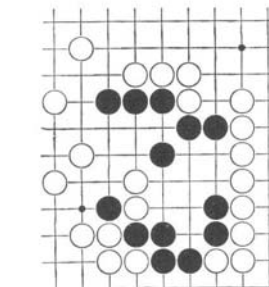
1. White to live

2. Black to live
or make a ko

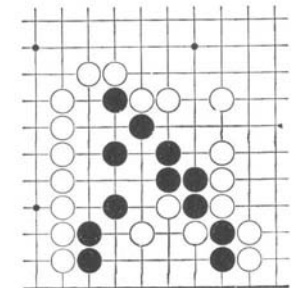
3. White to live



4. White to live

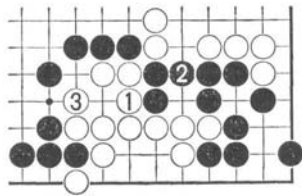


5. Black to live

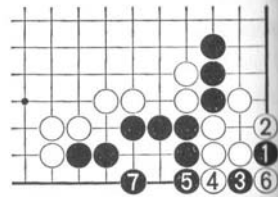


6. Black to live

Answers



Dia. 1



Dia. 2

1. Shortage of liberties

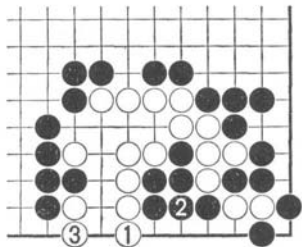
Dia. 1. White 1 threatens White 2, (shortage of liberties).

2. Start by attacking.

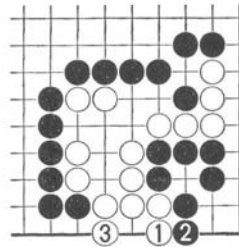
Dia. 2. Black should start by attacking with 1 and 3. White has no trouble if he answers 3 at 4, but then Black 5 becomes an atari, enabling Black to live with 7. If White plays 4 at 6 or 7, he can make a ko fight of it, but at the risk of losing his own corner group. Black could start by playing 1 at 5, but the sequence shown is better in that if White chooses the ko, Black can use 5 as a ko threat.

3. Descent

Dia. 3. White descends to 1, threatening a throw-in at 2. When Black connects, 3 gives White his second eye.



Dia. 3

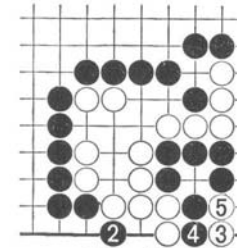


Dia. 4a

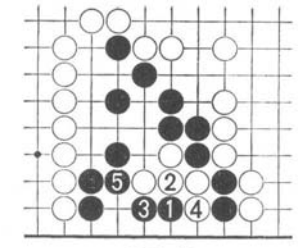
4. Descent

Dia. 4a. White descends to 1, threatening to kill the corner, then makes his second eye with 3.

Dia. 4b. Black cannot afford to stop the eye.



Dia. 4b



Dia. 5

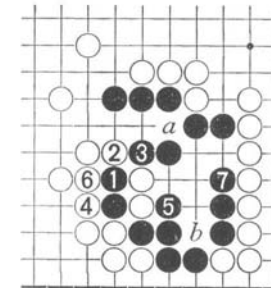
5. Peep

Dia. 5. Black peeps at 1, forcing White to connect at 2, crawls forward to 3, forcing White 4, and then plays 5, making an eye on the lower edge to go with his eye in the center.

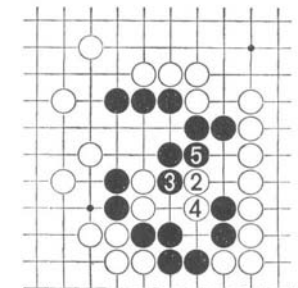
6. Sacrifice

Dia. 6a. Black must begin with the sacrifice at 1, so as to be able to play both 3 and 5 in sente. These two stones and Black 7 give him sure eyes at the points marked *a* and *b*. If Black started at 3, letting White answer at 1, he would have one eye, but would not be able to make the other.

Dia. 6b. Resistance with White 2 fails.



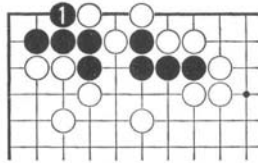
Dia. 6a



Dia. 6b

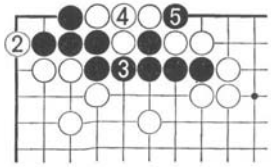
34. UNDER THE STONES

Some of the more deceptive life-and-death situations occur when it becomes necessary to see "under the stones" — to visualize what can happen in the space left after a group of stones has been captured and removed from the board. The following is a rather common example.

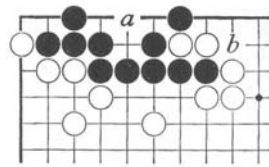


Dia. 1

Dia. 1. When Black gives atari at 1, some players might conclude that he is alive, but the truth is actually the opposite. White cannot avoid having some stones captured, but he can kill Black by playing under them. What should his next move be?



Dia. 2



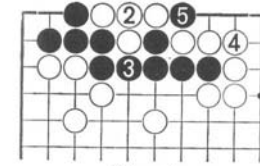
Dia. 3

Dia. 2. White 2 here is not the answer. Black gives atari again at 3. If White connects at 4, making a four-stone pyramid, Black captures at 5.

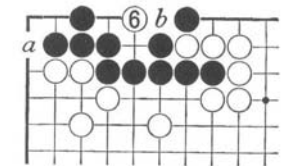
Dia. 3. This makes *a* and *b* miai, and Black is unconditionally alive.

Dia. 4. White's correct move is to connect immediately with

2. The sequence then progresses somewhat as before, with Black capturing four white stones, but this time —



Dia. 4

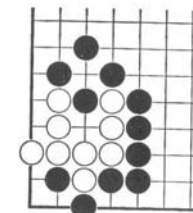


Dia. 5

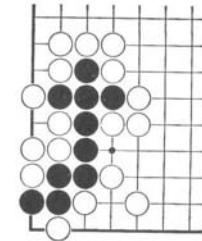
Dia. 5. White can play 6, making *a* and *b* miai, and Black dies. In order to find this sequence, White must visualize 6 under the stones from the very beginning in *Dia. 1*.

Some under-the-stones problems are rather startling, with one side making a seemingly irrevocable sacrifice, then swooping back to recapture. Two of the following problems are of that variety.

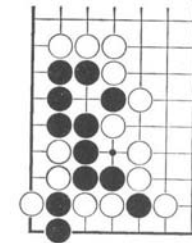
Problems



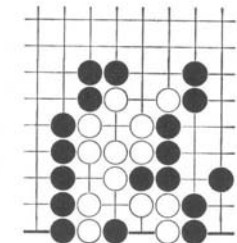
1. Status?



2. Status?

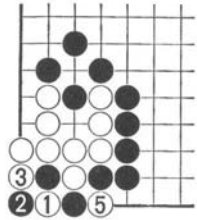


3. White to kill

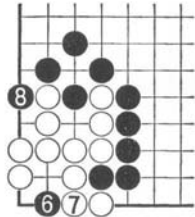


4. Status?

Answers



Dia. 1a
4: connects



Dia. 1b

1. White is dead.

Dia. 1a. The only way White could possibly live is by throwing in 1, but Black captures with 2 and connects, giving up a four-stone pyramid.

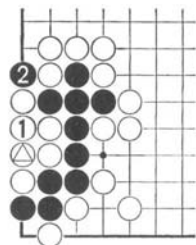
Dia. 1b. Black 6 makes 7 and 8 miai, so White is dead.

2. Black can make a ko. White can kill.

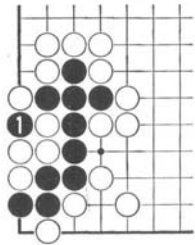
Dia. 2a. To kill Black, all White has to do is connect at 1. When Black captures at 2, White replays at the marked stone, the vital point of Black's bulky five shape.

Dia. 2b. What happens, then, when Black goes first and captures at 1, gaining a four-in-a-row shape?

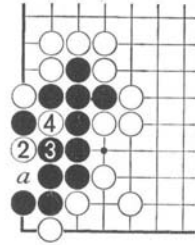
Dia. 2c. White 2 gives atari, and Black is forced to fight a ko. After 4, Black cannot give atari at *a* or White will connect, killing him unconditionally.



Dia. 2a

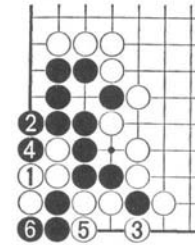


Dia. 2b

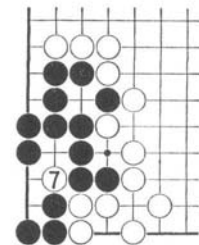


Dia. 2c

3: at the marked stone



Dia. 3a



Dia. 3b

3. Sacrifice four.

Dia. 3a. The key to this problem is White's connection at 1, sacrificing four stones. White willingly loses the race to capture, because —

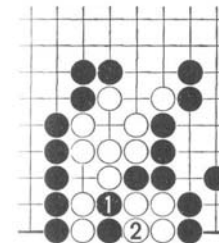
Dia. 3b. He can play 7 and recapture the three black stones in the corner.

4. White is alive.

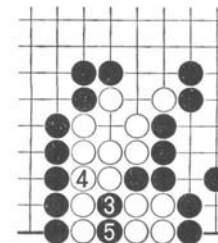
Dia. 4a. Black has what looks like a good attack at 1, forcing White to capture at 2.

Dia. 4b. Black follows with the throw-in at 3, expecting White 5 and Black 4, which would make White's eye false. White, however, sacrifices four stones to connect at 4.

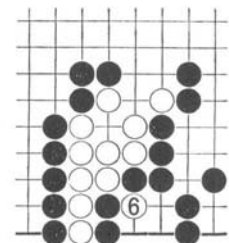
Dia. 4c. Recapturing at 6 gives White his second eye.



Dia. 4a



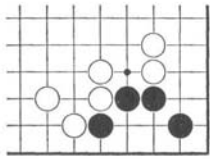
Dia. 4b



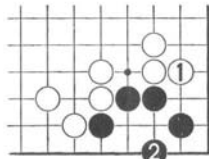
Dia. 4c

35. THE DIFFERENCE A LIBERTY MAKES

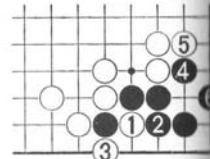
This section collects a few of the many positions in which the presence or absence of an outside liberty makes a big difference to the status of the group. The shapes we shall take up have all appeared before in this book in one form or another. Perhaps you recall the following example.



Dia. 1



Dia. 2

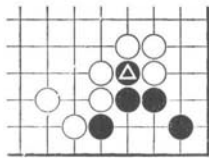


Dia. 3

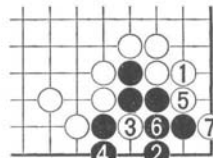
Dia. 1. As was proved in an earlier problem, this black corner group, with its outside liberty, is alive.

Dia. 2. If White attacks at 1, Black defends with the tesuji at 2.

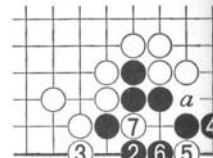
Dia. 3. Or if White decides to capture the black stone while he has the chance, Black can gain eye space on the right side.



Dia. 4



Dia. 5



Dia. 6

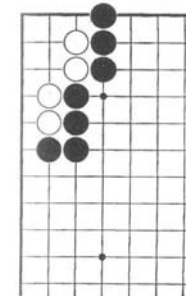
Dia. 4. But take away Black's liberty, and his status changes. Now White can kill him.

Dia. 5. White's attack comes at 1, and Black 2 no longer works because White 5 is an atari.

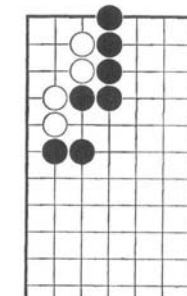
Dia. 6. If Black makes this diagonal connection with 2, White descends behind him at 3. Black 4 fails to make two eyes because of White 5 and 7. One can imagine other variations, such as Black 4 at 6, (White answers at *a*), or Black 2 at 7, (White answers at 6), but they end with Black dead.

Let this be a lesson to Black not to go around making moves like the marked stone in *Dia. 4* just because he can play them in sente. Liberties are always precious.

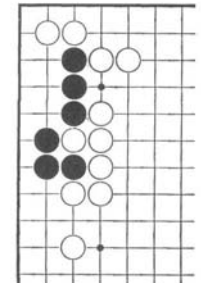
Problems



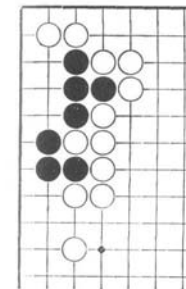
1. Status?



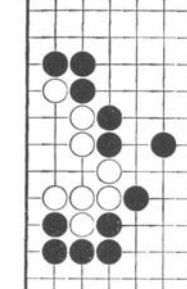
2. Status?



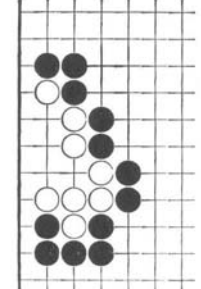
3. Status?



4. Status?

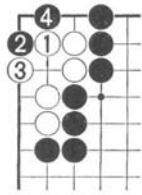


5. Status?

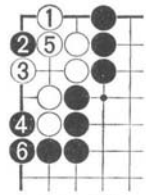


6. Status?

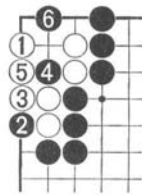
Answers



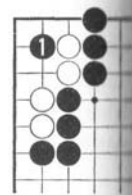
Dia. 1a



Dia. 1b



Dia. 1c



Dia. 1d

1. White can make a ko. Black can kill.

Dia. 1a. Ko is the best White can do. The sequence from 1 to 4 should be familiar by now.

Dia. 1b. If White tries to play at the upper one-two point, Black can kill him by taking the other one-two point and continuing as shown. (He must be careful not to play 4 at 5 in this sequence).

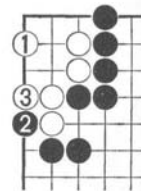
Dia. 1c. White cannot get anywhere by starting at the other one-two point, either, because Black 4 is an atari. Ko, as in *Dia. 1a*, is White's only hope.

Dia. 1d. If Black goes first, he has any number of ways to kill White.

2. White can live. Black can kill.

Dia. 2. Now White 1 works. With his extra liberty White can answer 2 at 3, and he is alive.

Of course, Black can still kill White as in *Dia. 1d* if he goes first.



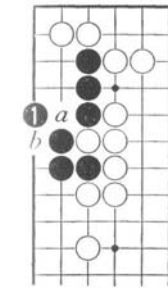
Dia. 2

3. Black can live. White can kill.

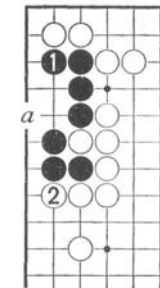
Dia. 3a. (next page) The diagonal play at 1 gives Black certain eyes at *a* and *b*. This is his only way to live.

Dia. 3b. Black 1 here fails, and 1 at 2 would be answered by White *a*.

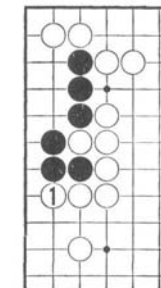
Dia. 3c. White can kill Black by just blocking at 1.



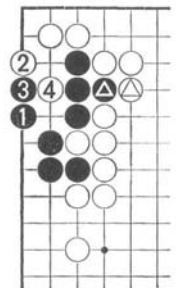
Dia. 3a



Dia. 3b



Dia. 3c



Dia. 4

4. Black is dead.

Dia. 4. Perhaps Black has blundered by exchanging his marked stone for Black's. At any rate, his diagonal play at 1 is now met by White's diagonal counter-play at 2.

5. White can live. Black can kill.

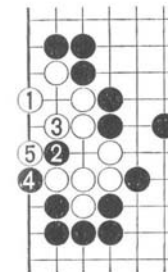
Dia. 5a. White lives by making the diagonal connection at 1, having the throw-in at 5 ready for Black 2 and 4.

Dia. 5b. Given the first move, Black can easily kill White.

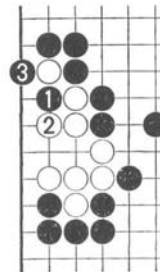
6. White can make a ko. Black can kill.

Dia. 6a. With the outside liberty gone, White 1 fails. Black 4 gives atari, leaving White no time to make his throw-in.

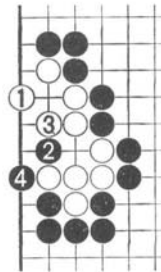
Dia. 6b. So White has to settle for a ko, which he can get by playing 1 and 3 as shown.



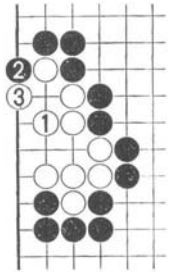
Dia. 5a



Dia. 5b



Dia. 6a

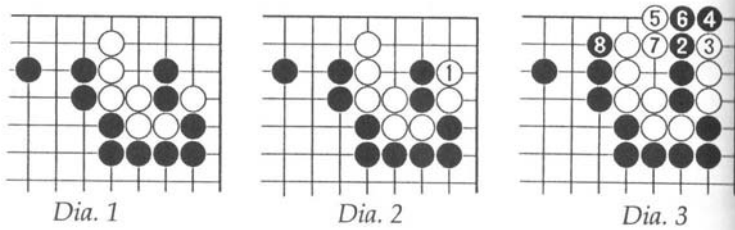


Dia. 6b

36. BUILDING EYE SHAPE

This book ends on an optimistic note — all of the last examples and problems are of groups that live.

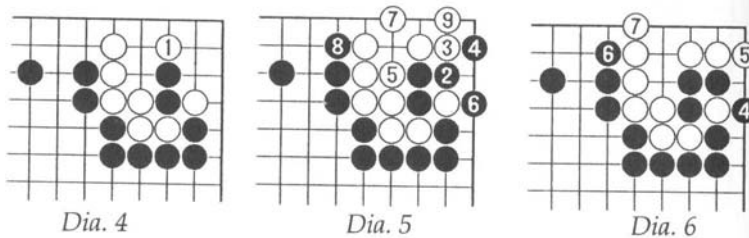
Dia. 1. We are concerned with groups that have only the bare beginnings of eye shape, or of shape for a second eye. The white group in this diagram is a good example.



Dia. 2. At first, it looks as if White can capture the two black stones by crawling out with 1.

Dia. 3. But Black wins the capturing race with the hane at 4. After Black 8, White cannot give atari from either side.

Since the two black stones in *Dia. 1* cannot be captured, White appears to have slim chances of living, but there is a way for him to save himself.

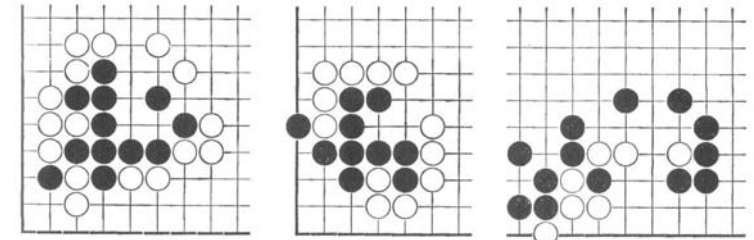


Dia. 4. White 1, a nose tesuji, is the first move. Whatever happened, *Dia. 3* proved that if Black gets to play at this point, White is finished.

Dia. 5. Black must answer at 2 or be captured. White neatly makes two eyes with 3, 5, 7, and 9.

Dia. 6. If Black plays 4 here, White lives with more territory.

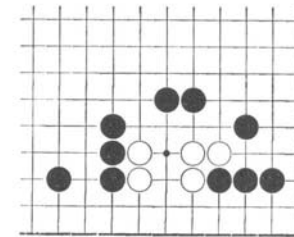
Problems



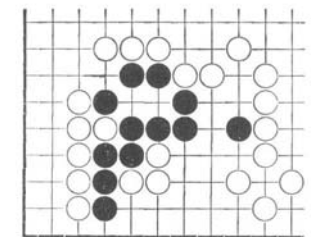
1. Black to live

2. Black to live

3. White to live

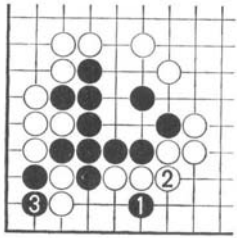


4. White to live

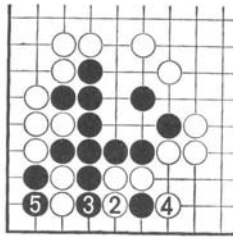


5. Black to live

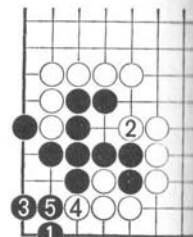
Answers



Dia. 1a



Dia. 1b



Dia. 2a

1. Belly tesuji

Dia. 1a. Black makes his second eye with the belly tesuji at 1. If White connects at 2, Black 3 captures the two stones in the corner, and if White played 2 at 3, Black 3 at 2 would capture another pair of white stones.

Dia. 1b. White 2 in this diagram works no better.

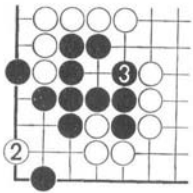
2. One-two point

Dia 2a. Black can live only by playing 1 at the one-two point. If White takes away the eye in the center, Black 3 makes a second eye in the corner.

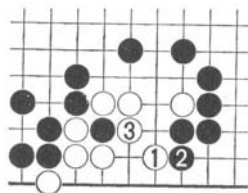
Dia. 2b. If White plays to hold Black to one eye in the corner — White 2 is one possible move — Black has sente to make his second eye in the center.

3. Door group

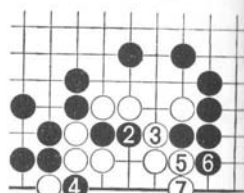
Dia. 3a. White 1 is the key play. If Black blocks at 2, White captures at 3 for one eye and has a second eye at the edge.



Dia. 2b

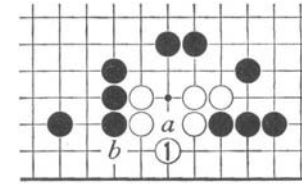


Dia. 3a

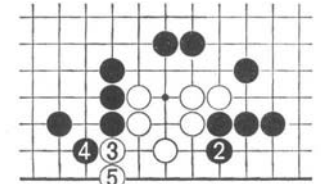


Dia. 3b

Dia. 3b. If Black tries to spoil White's eye shape with 2 and 4, White can regain it with 5 and 7. Similarly, Black 4 at 5 is answered by White 5 at 4. This formation is closely related to the door group.



Dia. 4a



Dia. 4b

4. Center of symmetry

Dia. 4a. White starts at the center of symmetry. This gives him one sure eye at *a*, and a second to either the right or left of 1 along the edge.

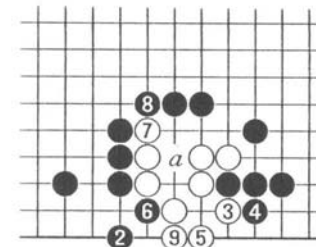
If White started at, say, *b*, Black would reply at 1 and kill him.

Dia. 4b. Black 2 and White 3 are miai.

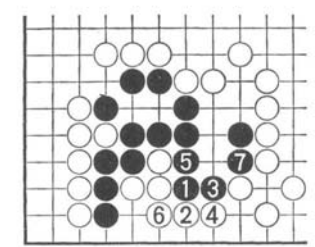
Dia. 4c. Black 2 is the strongest attack. Black 6 threatens a ko at 9 or throw-in at *a*, but White 7 defends against Black *a* while threatening to escape, so White is safe.

5. Attachment

Dia. 5. If Black finds the right attachment at 1, then 3 and 5 become his sente, and 7 completes the second eye.



Dia. 4c



Dia. 5