Examples for Ikeda Territory I Scoring - Part 5 / Rules 3+3+BF

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Rules

Preface

Because the pass rules and ko rules can affect strategies and scores of positions with kos, especially parts 5 or later shall be studied under different pass rules and ko rules, as far as time allows it. Here the used pass rules and ko rules are abbreviated by the symbol "3+3+BF". It stands for "3 passes stop the alternation, 3 passes end the playout, basic-fixed-ko-rules". This combination of pass rules and ko rules leads to the lowest strategic difficulty.

The Pass Rules and Ko Rules

- The alternation stops with a succession of 3 passes.
- The playout ends with a succession of 3 passes.
- *Basic-ko-rule-with-pass-threat:* A succession of 2 plays may not recreate the position.
- *Fixed-ko-rule:* A play is prohibited if the positions just before and just after it are the same and in the same order as the positions just before and just after an earlier play of the game.

Short Characterization of the Rules

3 passes required to stop the alternation make it still possible to execute recapture in a basic ko after using a pass as a ko threat. The basic-ko-rule-with-pass-threat enables legality of a recapture in a basic ko after at least one intervening move, regardless of whether it is a play or a pass. 3 passes required to end the playout allows dissolution of a so called dead ko even if the only available tenuki plays would fill one of two one-liberty eyes of one of one's own strings. The fixed-ko-rule allows positional recreation after a cycle with three or more plays but then prohibits repetition of the same follow-up play, i.e. the rule prohibits so called recycling.

Comparison to Positional-superko

If greatest simplicity of the rules is an important objective, then the following pass rules and ko rules could be used: "The alternation and the playout each end with 2 successive passes. Positional-superko is used: A play may not recreate a position."

This rules combination should be studied in the version Part 5 / Rules 2+2+SK. Here it shall only be pointed out that strategy would be considerably more complex than under the currently studied Rules 3+3+BF. The most remarkable strategic differences are: Under positional-superko and if one player has many more so called ko threats than his opponent, then postponing connection of the last one or two basic endgame kos until the playout can provide one extra point. Besides under positional-superko one player can sometimes use so called dame as ko threats while his opponent cannot.

It is a political decision whether the pass rules and ko rules shall be as simple as possible or whether endgame strategy in positions with only dame and basic endgame kos left shall be as simple as possible. Accordingly one would choose 2+2+SK or 3+3+BF, respectively, as the pass rules and ko rules. There is another aspect to be considered: So far understanding of non-existence of pass-fights is less exhaustive for 2+2+SK than for 3+3+BF. For the latter, non-existence of pass-fights has already been shown for positions with dame and basic endgame games.

Retrospect

How do previously discussed examples work under the Rules 3+3+BF?

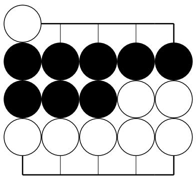
3 instead of 2 passes stopping the alternation change the player starting the playout. Because of the playout's last pass rule, the score is not affected by the playout's last pass itself. However, the score might be affected due to the rules change by a play postponed from the alternation to the playout. One cannot force postponement of dame or teire. The following is always postponed, i.e. regardless of the rules change: removals of so called dead strings or dead kos from divided areas or one-sided plays. So the previous regular example classes are not affected. Basic endgame kos might be affected by postponed connection but essentially they have not been studied before.

3 instead of 2 passes ending the playout do not change the score under typical ko rules. This has been proven formally in general. Furthermore it has been proven that the increased number of passes does not create pass-fights, either.

The basic-fixed ko rules instead of the positional-superko rule might affect positions with kos, however, in all examples with regular (!) dead kos, there is no difference.

Now a few of the earlier examples, which were studied under the Rules 2+2+SK in the parts 1 to 4, shall be revisited under the Rules 3+3+BF.

Example 1



General Information

- diagram index: 0001
- traditional description: "basic territories and dead stone"
- board size: 5x5
- board parity: odd
- black - white stones: 0
- to move: Black
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: 1
- pass-fight: none

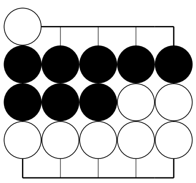
Remarks

The score under the Rules 3+3+BF is the same as the score under the Rules 2+2+SK. Even an attempt to change the parity of the number of moves in the playout is futile.

Variation 1

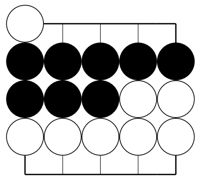
This is a possible perfect play.

Alternation



1 pass, 2 pass,
3 pass.

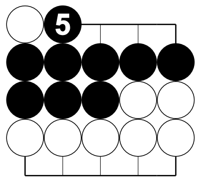
Position at the End of the Alternation



Agreement

The players disagree in the agreement phase.

Playout

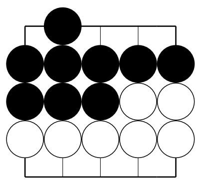


4 pass, 6 pass,
7 pass, 8 pass.

stones paid for passes: 1 black, 2 white
stones removed: 0 black, 1 white

There is an unequal number of moves in this playout. So the last pass is free.

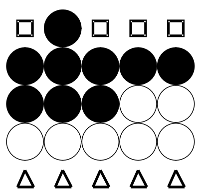
Position at the End of the Playout



prisoner stones: 1 black, 3 white

Scoring

There are 1 black and 3 white prisoner stones.



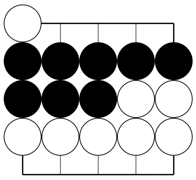
(4 + 3) - (5 + 1) = 1

Black's score consists of 4 points of territory and 3 white prisoner stones. White's score consists of 5 points of territory and 1 black prisoner stone.

Variation 2

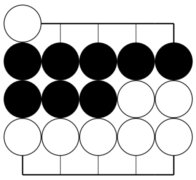
This is a possible perfect play.

Alternation



1 pass, 2 pass,
3 pass.

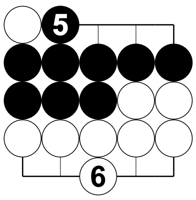
Position at the End of the Alternation



Agreement

The players disagree in the agreement phase.

Playout

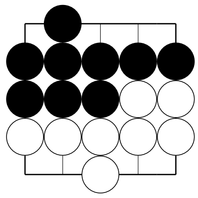


4 pass, 7 pass,
8 pass, 9 pass.

stones paid for passes: 2 black, 2 white
stones removed: 0 black, 1 white

There is an equal number of moves in this playout. So also the last pass is costly.

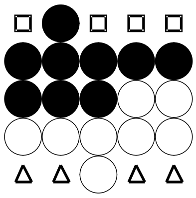
Position at the End of the Playout



prisoner stones: 2 black, 3 white

Scoring

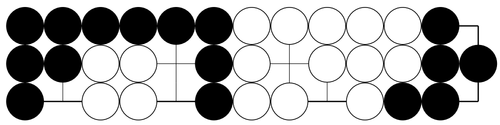
There are 2 black and 3 white prisoner stones.



$$(4 + 3) - (4 + 2) = 1$$

Black's score consists of 4 points of territory and 3 white prisoner stones. White's score consists of 4 points of territory and 2 black prisoner stones.

Example 2



General Information

- diagram index: 0025
- traditional description: "one-sided dame"
- board size: 13x3
- board parity: odd
- black - white stones: 0
- to move: Black
- frequency: 1:10 to 1:1,000
- total reading time: <1m
- perfect play score: -1
- pass-fight: none

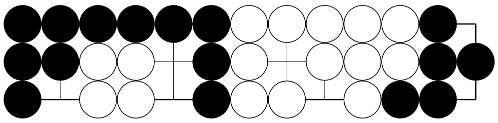
Remark

The score under the Rules 3+3+BF is the same as the score under the Rules 2+2+SK.

Variation 1

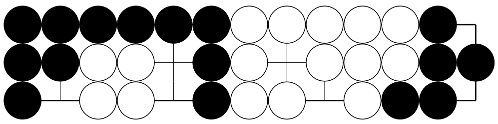
This is a possible perfect play.

Alternation



1 pass, 2 pass, 3 pass.

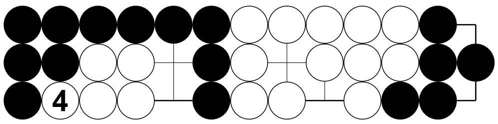
Position at the End of the Alternation



Agreement

The players disagree in the agreement phase.

Playout

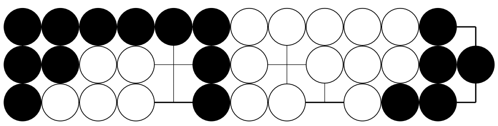


5 pass, 6 pass, 7 pass.

stones paid for passes: 2 black, 1 white
stones removed: 0 black, 0 white

There is an equal number of moves in this playout. So also the last pass is costly.

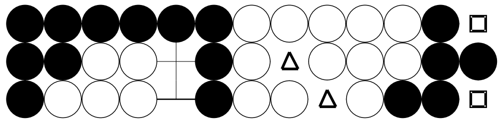
Position at the End of the Playout



prisoner stones: 2 black, 1 white

Scoring

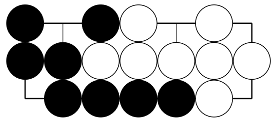
There are 2 black and 1 white prisoner stones.



(2 + 1) - (2 + 2) = -1

Black's score consists of 2 points of territory and 1 white prisoner stone. White's score consists of 2 points of territory and 2 black prisoner stones. The unmarked empty intersections score for neither player.

Example 3



General Information

- diagram index: 0029
- traditional description: "dead ko"
- board size: 7x3
- board parity: odd
- black - white stones: 0
- to move: Black
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: -21
- pass-fight: none

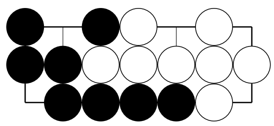
Remark

The score under the Rules 3+3+BF is the same as the score under the Rules 2+2+SK.

Variation 1

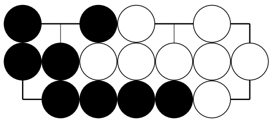
This is a possible perfect play.

Alternation



1 pass, 2 pass, 3 pass.

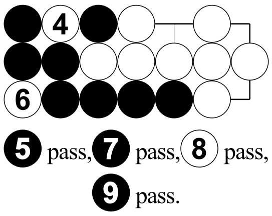
Position at the End of the Alternation



Agreement

The players disagree in the agreement phase.

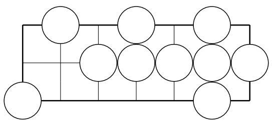
Playout



stones paid for passes: 3 black, 1 white
stones removed: 8 black, 0 white

There is an equal number of moves in this playout. So also the last pass is costly.

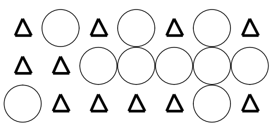
Position at the End of the Playout



prisoner stones: 11 black, 1 white

Scoring

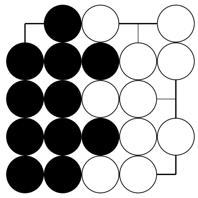
There are 11 black and 1 white prisoner stones.



(0 + 1) - (11 + 11) = -21

Black's score consists of 0 points of territory and 1 white prisoner stone. White's score consists of 11 points of territory and 11 black prisoner stones.

Example 4



General Information

- diagram index: 0038
- traditional description: "dead ko"
- board size: 5x5
- board parity: odd
- black - white stones: 1
- to move: White
- frequency: 1:10,000,000 to never
- total reading time: 3m
- perfect play score: -26
- pass-fight: none

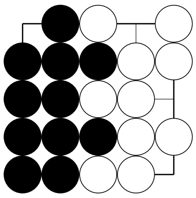
Remarks

Unlike diagram 0036 (example 1 of Irregular Dead Kos) under the Rules 2+2+SK, here in diagram 0038 under the Rules 3+3+BF White can dissolve the dead ko even after Black's capture in it during the playout. So the behaviour of these rare irregular dead kos depends on the pass rules and ko rules. Under 2+2+SK it can survive - under 3+3+BF it will be removed.

Variation 1

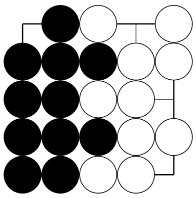
This is a possible perfect play. At move 5, White may not recapture due to the basic-ko-rule-with-pass-threat. Instead White 5 uses a pass as a ko threat. After move 6, the playout has not ended yet because it requires a succession of 3 passes to end the playout. So at move 7, White gets his principle chance to recapture the ko. White 7 is not prohibited by the basic-ko-rule-with-pass-threat because the plays 4 and 7 are not successive plays. If we suppose that Black's play 0 put some stone on the board, then the play White 7 is allowed also by the fixed-ko-rule: Although the position after play 7 equals the position after play 0, the position before play 7 differs from the position before play 0. However, if Black 8 recaptured the ko, this would violate both the basic-ko-rule-with-pass-threat and the fixed-ko-rule. So Black 8 passes.

Alternation



1 pass, 2 pass,
3 pass.

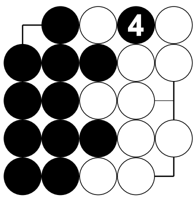
Position at the End of the Alternation



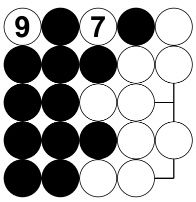
Agreement

The players disagree in the agreement phase.

Playout



5 pass, 6 pass.

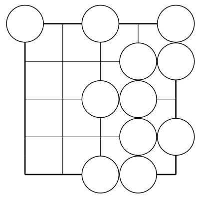


8 pass, 10 pass,
11 pass, 12 pass.

stones paid for passes: 3 black, 2 white
stones removed: 12 black, 1 white

There is an unequal number of moves in this playout. So the last pass is free.

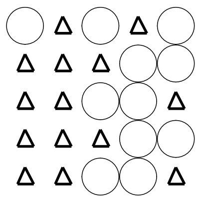
Position at the End of the Playout



prisoner stones: 15 black, 3 white

Scoring

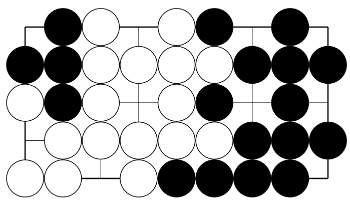
There are 15 black and 3 white prisoner stones.



$$(0 + 3) - (14 + 15) = -26$$

Black's score consists of 0 points of territory and 3 white prisoner stones. White's score consists of 14 points of territory and 15 black prisoner stones.

Example 5



General Information

- diagram index: 0037
- traditional description: "dead ko and two basic endgame kos"
- board size: 9x5
- board parity: odd
- black - white stones: 1
- to move: White
- frequency: 1:1 to 1:100
- total reading time: 3m
- perfect play score: -11
- pass-fight: none

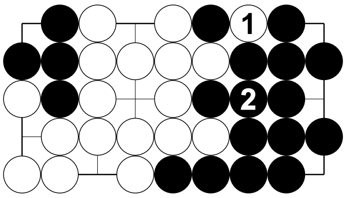
Remarks

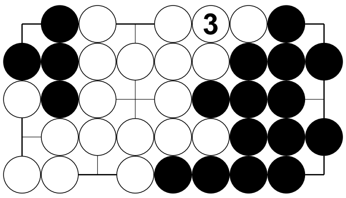
Under the Rules 3+3+BF, it is correct to connect the basic endgame kos already during the alternation. This behaviour and the score differ under the Rules 2+2+SK, where the perfect play score is -12. Under both pass and ko rulesets, there are no pass-fights.

Variation 1

This is a possible perfect play.

Alternation

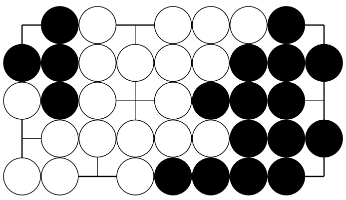




4 pass, 5 pass, 6 pass.

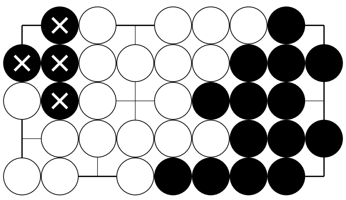
Position at the End of the Alternation

There are 1 black and 0 white prisoner stones.

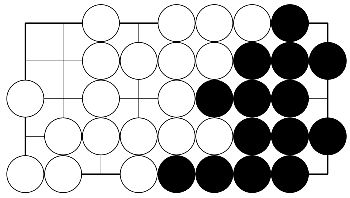


Agreement

The players agree to remove the marked string.



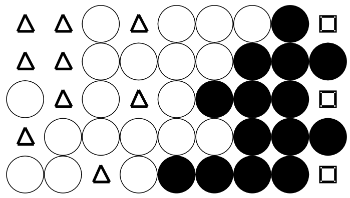
Position at the End of the Agreement



prisoner stones: 5 black, 0 white

Scoring

There are 5 black and 0 white prisoner stones.



(3 + 0) - (9 + 5) = -11

Black's score consists of 3 points of territory and 0 white prisoner stones. White's score consists of 9 points of territory and 5 black prisoner stones.

Basic Endgame Kos

The positions discussed here have basic endgame kos, are with or without two-sided dame, and are without teire. A basic endgame ko is a basic ko in between so called independently alive strings of both players. In other words, the position except for the intersections with basic endgame kos or two-sided dame is regularly divided.

Inside the regularly divided parts of the board, there may be ko threats available for Black or White. Also simple tenukis may be available there. Without loss of generality, Black shall have equally many open kos as or more open kos than White. This restriction is made to simplify general, theoretical study, but in practical application, it is straightforward to allow the opposite case, too. The numbers of ko threats are finite, all ko threats are independent from each other, and all ko threat and answer sequences shall consist of exactly 2 plays.

This class of positions has been solved formally in general for arbitrary numbers of kos open for Black, kos open for White, two-sided dame, ko threats for Black, ko threats for White, and an arbitrary starting player! The solution can be summarized in the following table, where the score presumes the score difference 0 on the regularly divided rest of the board. K is the number of kos open for Black minus the number of kos open for

White. T is the number of ko threats for Black minus the number of ko threats for White. MOD gives the rest after division.

to move	case	score	ko fight (winner)
Black / White	K MOD 3 = 0	-K/3	no
Black	K MOD 3 = 1	-K/3 + 1/3	no
White	K MOD 3 = 1 and T > 0	-K/3 + 1/3	Black
White	K MOD 3 = 1 and T <= 0	-K/3 - 2/3	White
Black	K MOD 3 = 2 and T > 0	-K/3 + 2/3	Black
Black	K MOD 3 = 2 and T <= 0	-K/3 - 1/3	White
White	K MOD 3 = 2	-K/3 - 1/3	no

Example: Imagine a position with the following features: White to move, 57 two-sided dame, 6 kos open for Black, 2 kos open for White, 14 ko threats for Black, 13 ko threats for White. Then K = 6 - 2 = 4, the rest after division by 3 is 1 (this is K MOD 3 = 1), and T = 14 - 13 = 1 (this is T > 0, i.e. Black has strictly more ko threats than White). So, according to the table, Black wins the ko fight and the score is -K/3 + 1/3 = -4/3 + 1/3 = -1 (White wins by 1 point).

What does building the rest modulo 3 mean in practice? Firstly, as far as pairs of kos open for Black and White are available, either player connects one further ko. Secondly, as far as triples of kos open for Black are available, Black connects two kos and White captures and connects one ko per triple. Thirdly, if one excess ko remains, then a ko fight occurs and only in that case numbers of ko threats become relevant.

Another formally and generally proven fact is that either player can force his opponent so that all basic endgame kos and two-sided dame are filled until the end of the alternation! None of the basic endgame kos needs to survive until the playout. Therefore, under the Rules 3+3+BF, a player cannot get an extra advantage from filling some basic endgame kos during the playout. The basic strategic idea behind this is to fill or else capture yet another ko whenever possible and when one does not have to play or answer a ko threat. More about general strategy has been discussed on rec.games.go in the author's threads about Endgame Strategy.

Furthermore it is proven formally and generally for each of the cases above that pass-fights do not occur! In particular, this applies to each example in this section.

Under the Rules 3+3+BF, two-sided dame do not provide ko threats that would have to be answered if played in a fake attempt to make a ko threat.

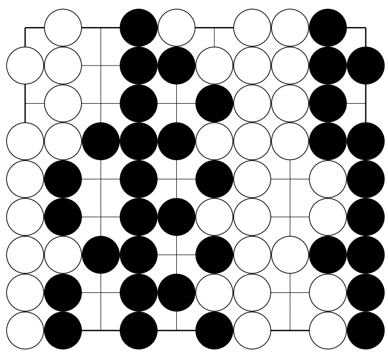
Has the reader already concluded that the miai value per ko is either 1/3 or -1/3, in favour of the opponent of the player for whom the ko is initially open?

The examples below are just that - examples. The general solution stated above of all positions should be taken much more seriously though. Since this class of examples is solved in general, only very few variations are studied for the given examples.

It should be noted that now Ikeda Territory I Scoring combined with the pass rules and ko rules abbreviated as 3+3+BF is essentially ready for application! Although Ikeda Territory I Scoring has hardly been tested in real games, the study of frequent example classes in the parts 1 to 5 and the theoretical study elsewhere are similarly sufficient. All that one really would still like to see studied a bit more carefully is some example positions with basic endgame kos and teire and some positions with a double ko death. One might study further positions with scarce or rare ko shapes, but that would be fun rather than necessary. Study of positions with basic endgame kos and removable strings in divided areas is not really necessary because the kos and two-sided dame can be filled during the alternation and then, at the start of the playout, the whole-board position is divided.

In all examples, the stated total reading time presumes prior knowledge of the general strategic theory explained above.

Example 1



General Information

- diagram index: 0039
- traditional description: "5 basic endgame kos, 3 two-sided dame, 2 black ko threats, 2 white ko threats"
- board size: 10x9
- board parity: even

- black - white stones: 0
- to move: Black
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: -1
- pass-fight: none

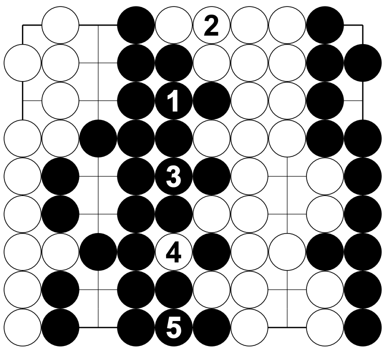
Remarks

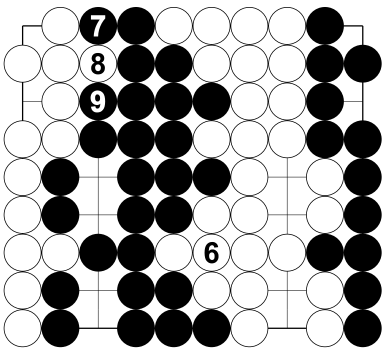
This is Black to move in the case "K MOD 3 = 0". Here K = 4 - 1 = 3. The score is -K/3 = -3/3 = -1. It is independent of numbers of ko threats and of two-sided dame. There is no ko fight.

Variation 1

This is a possible perfect play.

Alternation

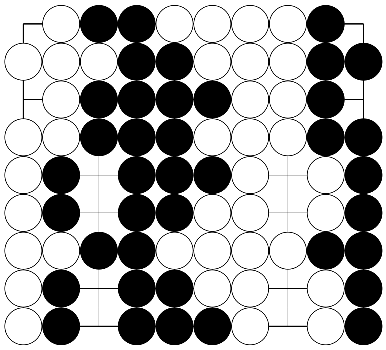




10 pass, 11 pass, 12 pass.

Position at the End of the Alternation

There are 1 black and 0 white prisoner stones.

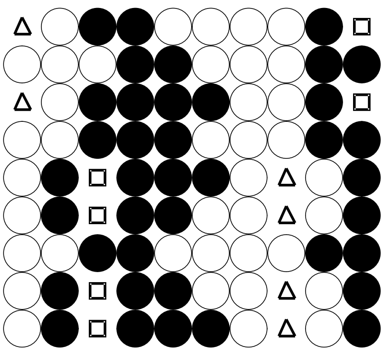


Agreement

The players agree not to remove any strings.

Scoring

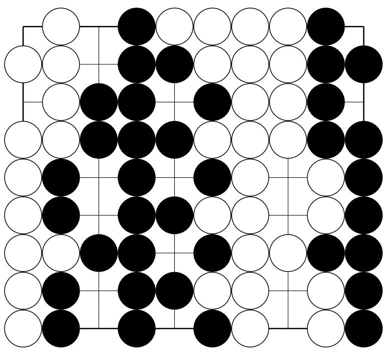
There are 1 black and 0 white prisoner stones.



(6 + 0) - (6 + 1) = -1

Black's score consists of 6 points of territory and 0 white prisoner stones. White's score consists of 6 points of territory and 1 black prisoner stone.

Example 2



General Information

- diagram index: 0040
- traditional description: "4 basic endgame kos, 2 two-sided dame, 2 black ko threats, 2 white ko threats"
- board size: 10x9
- board parity: even
- black - white stones: 0
- to move: Black
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: -1
- pass-fight: none

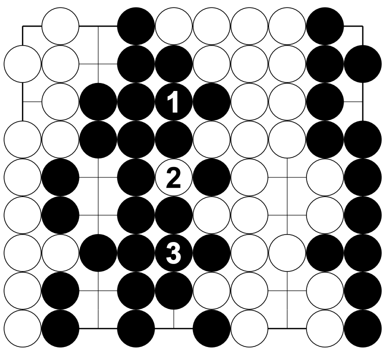
Remarks

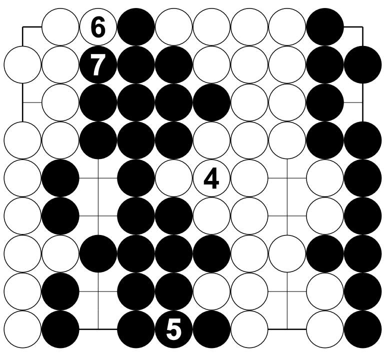
This is Black to move in the case "K MOD 3 = 1". Here K = 4 - 0 = 4. The score is -K/3 + 1/3 = -4/3 + 1/3 = -1. It is independent of numbers of ko threats and of two-sided dame. There is no ko fight.

Variation 1

This is a possible perfect play.

Alternation

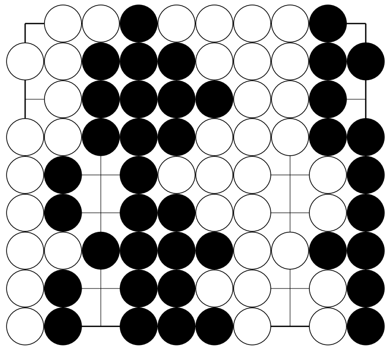




8 pass, 9 pass, 10 pass.

Position at the End of the Alternation

There are 1 black and 0 white prisoner stones.

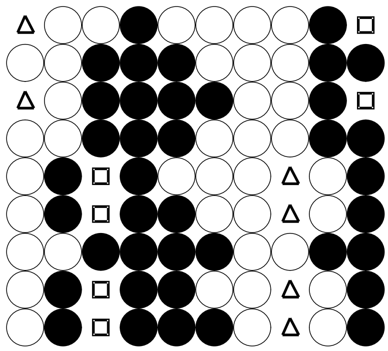


Agreement

The players agree not to remove any strings.

Scoring

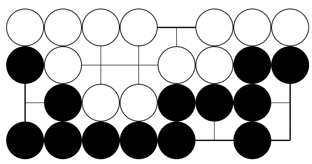
There are 1 black and 0 white prisoner stones.



(6 + 0) - (6 + 1) = -1

Black's score consists of 6 points of territory and 0 white prisoner stones. White's score consists of 6 points of territory and 1 black prisoner stone.

Example 3



General Information

- diagram index: 0041

- traditional description: "1 basic endgame ko, 1 black ko threat"
- board size: 8x4
- board parity: even
- black - white stones: 1
- to move: White
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: 0
- pass-fight: none

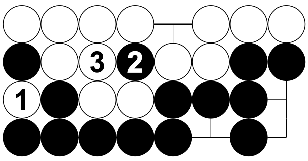
Remarks

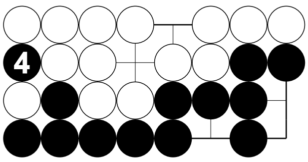
This is White to move in the case "K MOD 3 = 1 and T > 0". Here K = 1 - 0 = 1 and T = 1 - 0 = 1. The score is -K/3 + 1/3 = -1/3 + 1/3 = 0. Black wins the ko fight. The number of two-sided dame, which is 0 here, does not matter.

Variation 1

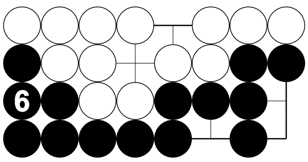
This is a possible perfect play.

Alternation





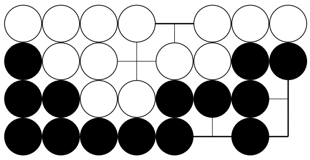
5 pass.



7 pass, 8 pass, 9 pass.

Position at the End of the Alternation

There are 2 black and 1 white prisoner stones.

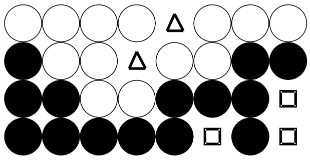


Agreement

The players agree not to remove any strings.

Scoring

There are 2 black and 1 white prisoner stones.



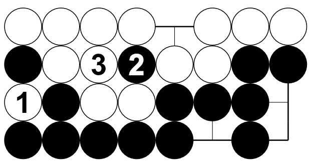
(3 + 1) - (2 + 2) = 0

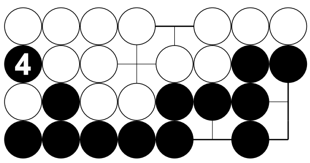
Black's score consists of 3 points of territory and 1 white prisoner stone. White's score consists of 2 points of territory and 2 black prisoner stones.

Variation 2

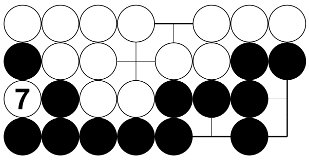
Move 6, which attempts to postpone connection of the ko until the playout, is a strategic mistake. With play 7, White may recapture the stone 4 because, after the intervening passes 5 and 6, the basic-ko-rule-with-pass-threat allows it, it requires three successive passes to stop the alternation, and the fixed-ko-rule does not prohibit play 7 either: Although the position after play 7 is the same as the position after play 3, the position before play 7 differs from the position before play 3.

Alternation

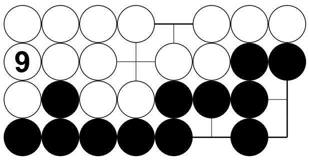




5 pass, 6 pass.



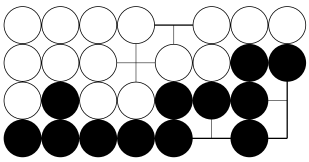
8 pass.



10 pass, 11 pass, 12 pass.

Position at the End of the Alternation

There are 3 black and 1 white prisoner stones.

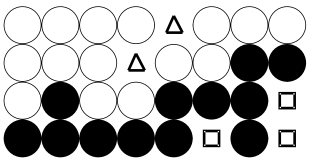


Agreement

The players agree not to remove any strings.

Scoring

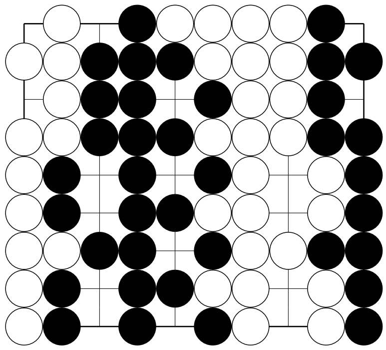
There are 3 black and 1 white prisoner stones.



(3 + 1) - (2 + 3) = -1

Black's score consists of 3 points of territory and 1 white prisoner stone. White's score consists of 2 points of territory and 3 black prisoner stones.

Example 4



General Information

- diagram index: 0042
- traditional description: "4 basic endgame kos, 1 two-sided dame, 2 black ko threats, 2 white ko threats"
- board size: 10x9
- board parity: even
- black - white stones: 1
- to move: White
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: -2
- pass-fight: none

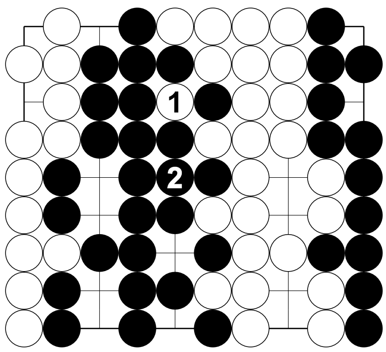
Remarks

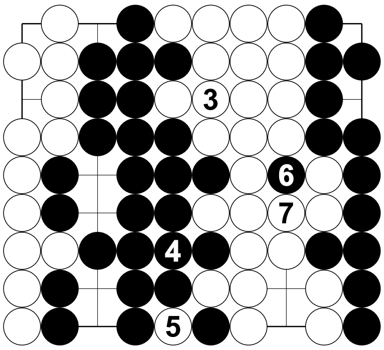
This is White to move in the case "K MOD 3 = 1 and T <= 0". Here K = 4 - 0 = 4 and T = 2 - 2 = 0. The score is -K/3 - 2/3 = -4/3 - 2/3 = -2. White wins the ko fight. The number of two-sided dame, which is 1 here, does not matter.

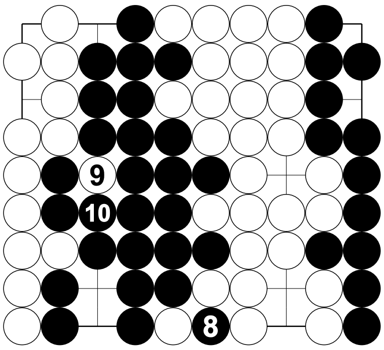
Variation 1

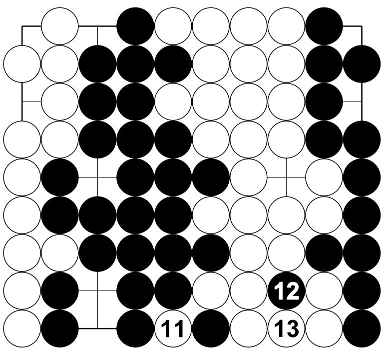
This is a possible perfect play.

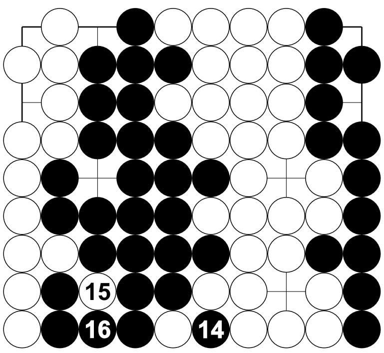
Alternation

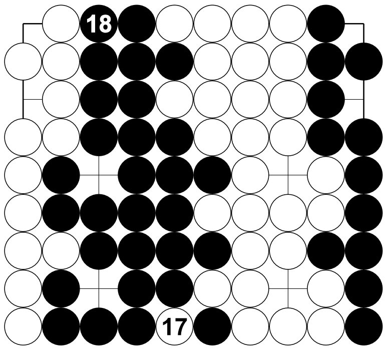


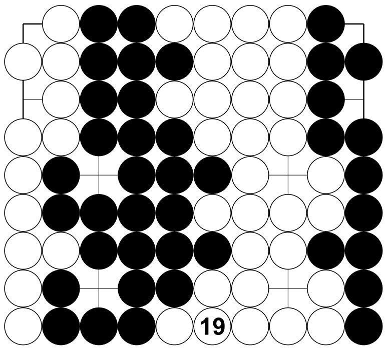








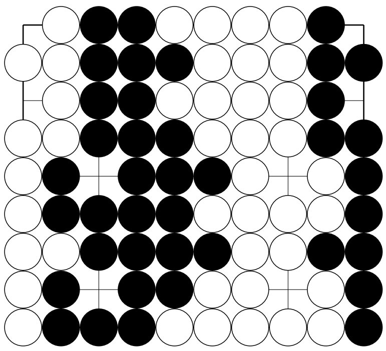




20 pass, 21 pass, 22 pass.

Position at the End of the Alternation

There are 6 black and 4 white prisoner stones.

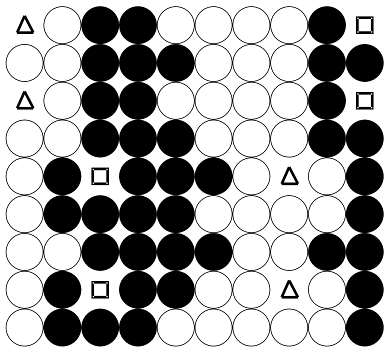


Agreement

The players agree not to remove any strings.

Scoring

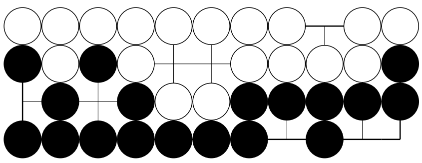
There are 6 black and 4 white prisoner stones.



(4 + 4) - (4 + 6) = -2

Black's score consists of 4 points of territory and 4 white prisoner stones. White's score consists of 4 points of territory and 6 black prisoner stones.

Example 5



General Information

- diagram index: 0043
- traditional description: "2 basic endgame kos, 1 black ko threat"
- board size: 11x4
- board parity: even
- black - white stones: 0
- to move: Black
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: 0
- pass-fight: none

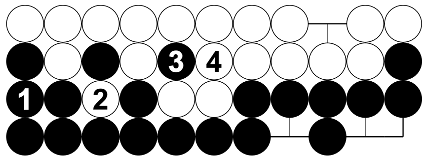
Remarks

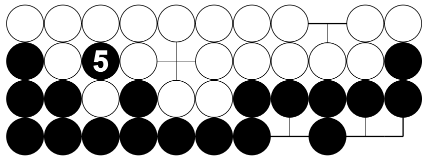
This is Black to move in the case "K MOD 3 = 2 and T > 0". Here K = 2 - 0 = 2 and T = 1 - 0 = 1. The score is -K/3 + 2/3 = -2/3 + 2/3 = 0. Black wins the ko fight. The number of two-sided dame, which is 0 here, does not matter.

Variation 1

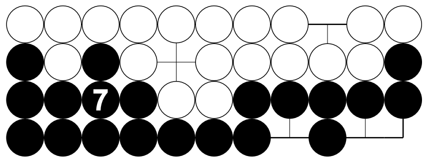
This is a possible perfect play.

Alternation





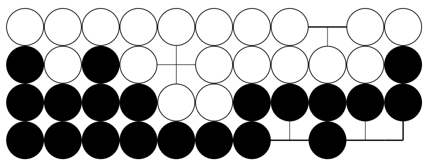
6 pass.



8 pass, 9 pass, 10 pass.

Position at the End of the Alternation

There are 2 black and 1 white prisoner stones.

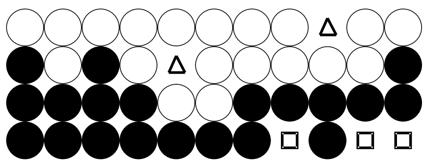


Agreement

The players agree not to remove any strings.

Scoring

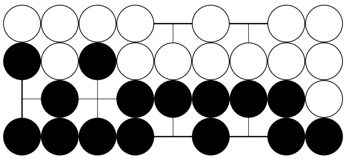
There are 2 black and 1 white prisoner stones.



(3 + 1) - (2 + 2) = 0

Black's score consists of 3 points of territory and 1 white prisoner stone. White's score consists of 2 points of territory and 2 black prisoner stones.

Example 6



General Information

- diagram index: 0044
- traditional description: "2 basic endgame kos"
- board size: 9x4
- board parity: even
- black - white stones: 0
- to move: Black
- frequency: 1:1 to 1:10
- total reading time: <1m
- perfect play score: -1
- pass-fight: none

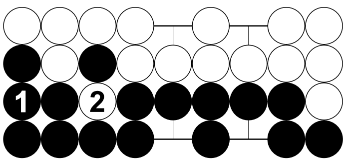
Remarks

This is Black to move in the case "K MOD 3 = 2 and T <= 0". Here K = 2 - 0 = 2 and T = 0 - 0 = 0. The score is -K/3 - 1/3 = -2/3 - 1/3 = -1. White wins the ko fight. The number of two-sided dame, which is 0 here, does not matter.

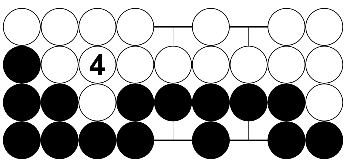
Variation 1

This is a possible perfect play.

Alternation



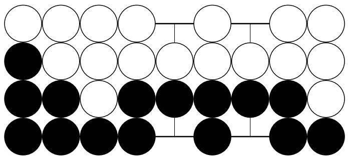
3 pass.



5 pass, 6 pass, 7 pass.

Position at the End of the Alternation

There are 1 black and 0 white prisoner stones.

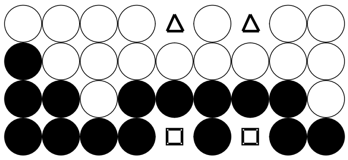


Agreement

The players agree not to remove any strings.

Scoring

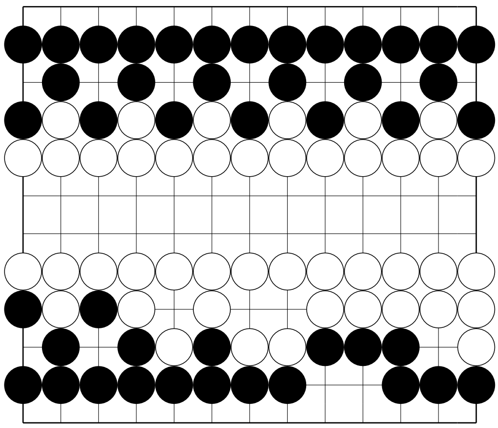
There are 1 black and 0 white prisoner stones.



(2 + 0) - (2 + 1) = -1

Black's score consists of 2 points of territory and 0 white prisoner stones. White's score consists of 2 points of territory and 1 black prisoner stone.

Example 7



General Information

- diagram index: 0045
- traditional description: "10 basic endgame kos, 1 two-sided dame, 1 black ko threat"
- board size: 13x12
- board parity: even
- black - white stones: 1
- to move: White
- frequency: 1:1 to 1:10

- total reading time: <1m
- perfect play score: -3
- pass-fight: none

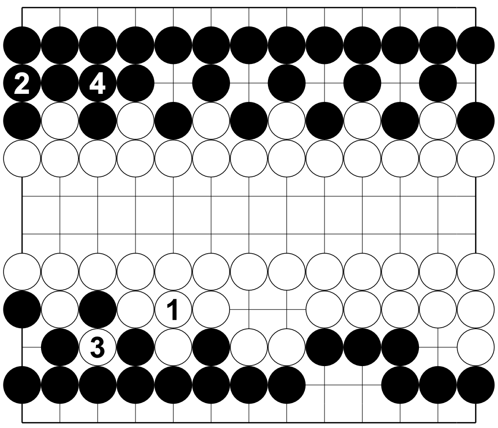
Remarks

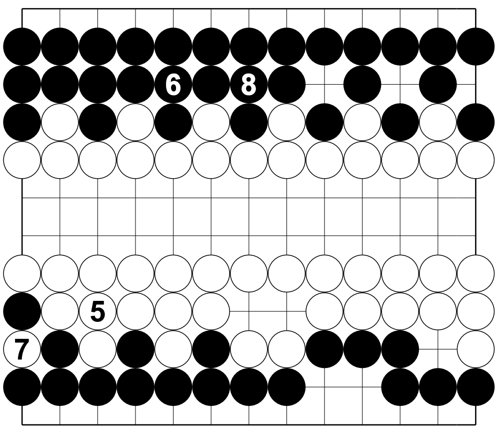
This is White to move in the case "K MOD 3 = 2". Here K = 9 - 1 = 8 and T = 1 - 0 = 1. The score is -K/3 - 1/3 = -8/3 - 1/3 = -3. It is independent of numbers of ko threats and of two-sided dame. There is no ko fight. The stated frequency refers to the general case on average rather than the particular numbers of 9 and 1 kos for Black and White, respectively.

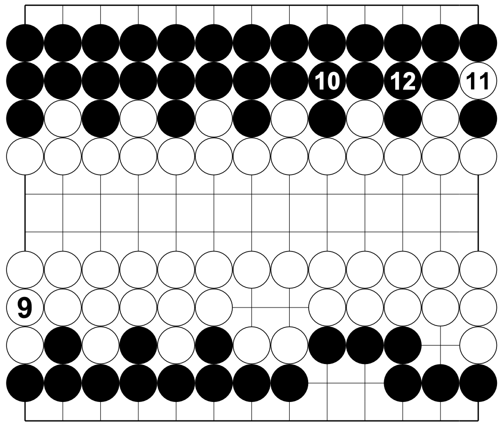
Variation 1

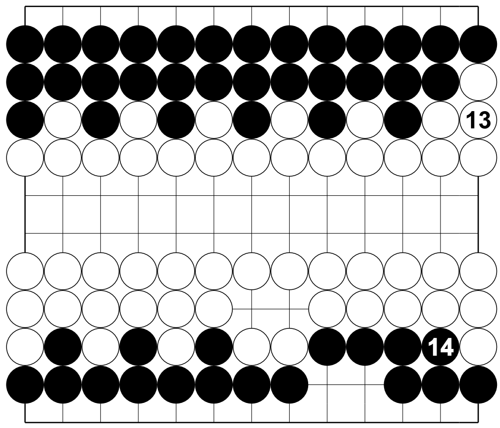
This is a possible perfect play.

Alternation





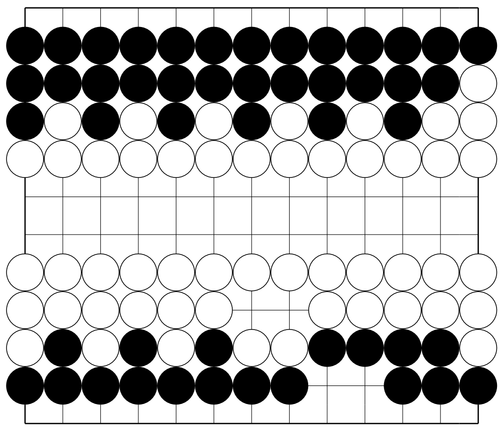




15 pass, 16 pass, 17 pass.

Position at the End of the Alternation

There are 3 black and 0 white prisoner stones.

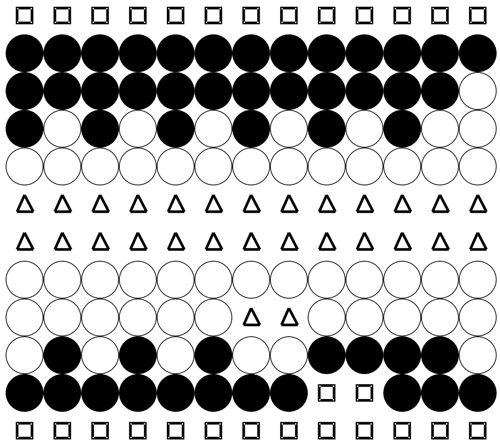


Agreement

The players agree not to remove any strings.

Scoring

There are 3 black and 0 white prisoner stones.



(28 + 0) - (28 + 3) = -3

Black's score consists of 28 points of territory and 0 white prisoner stones. White's score consists of 28 points of territory and 3 black prisoner stones.