## $6 \times 6$-Board

## Renju Problems - 1



Black to play and win

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6\times6-Board Renju Problems - 1
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## Terms and Notation

4-move : to make a Four.
3-move : to make a Three.
4-3 : Four-Three, a fork consisting of one Four and one Three.
3-3 : double-Three, a fork consisting of two Threes. Forbidden for Black.
4-4 : double-Four, a fork consisting of two Fours. Forbidden for Black.
Overline : an unbroken row consisting of six or more stones of the same color. Forbidden for Black, but one of winning patterns for White.

Threat : Three, Four, Mise-move, or Fukumi-move.
Mise-move : a move which threatens to make 4-3.
Fukumi-move : a move which threatens to make VCF.
VCF : Victory by Continuous Fours.
VCT : Victory by Continuous Threats.
double-Mise-move : a move which threatens to make two kinds of 4-3.
Nori-move : a move which may be able to block opponent's VCF, VCT or Threat by making a counter-Threat.
(A;B;C;••) : Continuous Fours. Defense moves are omitted.
$\langle\mathbf{A} \rightarrow \mathbf{B}\rangle$ : Attacker plays $A$ first and $B$ next, wherever his opponent defends against $A$. $A$ is a Threat except Four, and $B$ is a final winning pattern such as 4-3. The form of B may be 'C or D', '(C;D;•. )' or the combination. For example, "Black wins by $<3 \rightarrow A$ or $(B ; C)>$ ".

A/B : A instead of B. For example, "C/3 is met by White d". It means that "C instead of 3 results in failure by White strong defense $d$ ".

## 6 $\times$ 6-Board Renju Problems - 1

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The Web site of Tokai Renju Association has some pages on Renju problems, where one can enjoy solving them interactively. One of those pages is on $6 \times 6$-board Renju problems[2].

This booklet is a translation of [3] in References. All problems in this booklet and [3] are found in the Web site.

## 1 On 6×6-Board Renju Problems

$15 \times 15$-boards are used in Renju games. The boards are also used in Renju problems, of course. $6 \times 6$-board Renju problems use $6 \times 6$-board as the name shows. They are considered as intelligent games or intelligent puzzles based on the Renju rule.

The rule of $6 \times 6$-board Renju problems is weakened by removing some of real game elements. For example, the condition on numbers of Black and White stones are not required. It is possible that no defensive stones are on a board. It is impossible that a Black stone is at a center of the board ( $6 \times 6$-board has not a center).

Since non-meaningless Renju problems require at least 6 in length and in width, $6 \times 6$-boards are minimum. Although the board is very small, many good offensive and defensive tactics found in normal Renju games can be also found in $6 \times 6$-board problems. We can say that those problems are suitable for learning and enjoying such tactics in the condensed form. Furthermore, by using small boards we get such merit as good training for complete looking-ahead or calculation about all variations. Those problems, however, occasionally require a little different sense from that of normal Renju, so it is also a good idea that one enjoys them comfortably as intelligent puzzles of a joyful field in the large world of Renju.

The rule of Renju problems says the defenders must select his moves so that the sequence becomes longer. It is also true on $6 \times 6$-board problems. But the case of trapping Black into forbidden moves is treated as exception of the rule in this booklet for simplifying the solution.

The problems shown in the Web page are classified into two parts, VCT problems and VCF problems. VCT problems are classified again into three levels, that is, elementary, middle and advanced levels. The same classification is used in this booklet.

Although the author has paid full attention when making and analysing problems, there may be some problems which have extra or no winning sequences. Moreover, there may be imperfect or unsuitable description. If you find such faults, please inform the author. Thank you in advance.

## 2 Elementary Level VCT Problems


$\left[\mathbf{A 0 1}_{\text {(со37) }}\right]^{1}$ Black to play and win.
Hint: Black wins simply but nicely, if he notices the first correct move.

[A02(co25)] Black to play and win.
Hint: Make a basic plan, consider some variations, and take action.

[ $\left.\mathbf{A 0 3}_{\text {(coos) }}\right]$ Black to play and win.
Hint: Jump, jump and jump.

[A04(co38)] Black to play and win.
Hint: The first move determines success or failure.

[^0]
[A04 Ans] Black wins by $\langle 3 \rightarrow(A ; B)>$.

- if 2 elsewhere, Black wins by (C;D)

Forcing 2 at the left edge is the point of this problem.

[^1]
[ $\boldsymbol{A 0 5}_{(\mathrm{c} 049)}$ ] Black to play and win.
Hint: We can find some candidates for the first move, but all candidates except the correct move suffer strong defenses.

[ $\mathbf{A 0 6}_{(\mathrm{c} 013)}$ ] Black to play and win.
Hint: Go on toward the spot where 4-3 is expected.
If $15 \times 15$-boards were used, we could find easily Three followed by 4-3. Note that slantwise Threes are realized only on two diagonal lines in $6 \times 6$-boards.

[ $\left.\mathbf{A 0 7}_{(\mathrm{co32})}\right]$ Black to play and win.
Hint: Easy if correct order of moves is selected.

[ $\mathbf{A 0 8}_{(\mathrm{c} 027)}$ ] Black to play and win.
Hint: Use basic tactics which often appear in real games.

[A05 Ans] Black wins by $<1 \rightarrow \mathrm{~A}$ or $(\mathrm{B} ; \mathrm{C})$ or (B;D;A;E)>.
The strongest defense against 1 is $f$.
\# $\mathrm{B} / 1$ is met by White $1, \mathrm{C} / 1$ by $\mathrm{f}, \mathrm{D} / 1$ by E and $\mathrm{E} / 1$ by 1 .

[A06 Ans] Black wins by $\langle 3 \rightarrow(\mathrm{~A} ; \mathrm{B})>$. White 4-move agaist 3 is ineffective ${ }^{4}$.

- if 2 elsewhere, Black wins by $\langle 3 \rightarrow A>$
$\#<B \rightarrow A>$ is not correct, since $B$ is not Three. 2 followed by $\langle C \rightarrow A\rangle$ is not correct, since $C$ is not Three.

[A07 Ans] Black wins by $\langle 5 \rightarrow$ A $\rangle$.
- same wherever 4
- if 2 elsewhere, Black wins by $\langle 4 \rightarrow 2>$
\# 3/1 is met by White 4 , and next 1 by White b. $4 / 1$ is met by White 3 .

[A08 Ans] Black wins by $\langle 3 \rightarrow$ A .
- same wherever 2
\# $3 / 1$ is met by White b-etc ${ }^{5}$.

[^2]
[ $\mathbf{A 0 9}_{(\mathrm{co05})}$ ] Black to play and win. Hint: There may be Nori-move, but ...

[ $\left.\mathbf{A 1 0}_{(\mathrm{co001)}}\right]$ Black to play and win.
Hint: Be careful about the fake Three and White 4move.

[ $\operatorname{A11}_{(\mathrm{c} 046)}$ ] Black to play and win.
Hint: Consider in advance the way how to cope with White Nori-move.

[ $\left.\boldsymbol{A 1 2}_{(\mathrm{co11)}}\right]$ White to play and win.
Hint: Use White's privilege effectively.

[A11 Ans] Black wins by $\left\langle 3 \rightarrow \mathrm{~B}\right.$ or $(\mathrm{A}(; \mathrm{C}))^{6}$.

- if 2 elsewhere, Black wins at A \# $3 / 1$ is met by White d .

[A12 Ans] After 5, Black is forced to make a forbidden 3-3 at X.
- same wherever 2 and $4^{7}$

This is a basic problem to trap Black into forbidden moves.

[^3]
[ $\mathbf{A 1 3}_{(\mathrm{co34)}}$ ] Black to play and win.
Hint: Link the left side power with right side one successfully.
[ A14(c030) ${ }_{(1)}$ Black to play and win.
Hint: The first move applies basic tactics. Consider the defense variations.
[ A15(c026) ${ }^{(1)}$ Black to play and win.
Hint: There may be Nori-move, but the correct sequence of moves defeats it.

[ $\operatorname{A16}_{(\mathrm{co36)}}$ ] Black to play and win.
Hint: Consider in advance whether White plays Norimove.

[A13 Ans] Black wins by $\langle 3 \rightarrow(\mathrm{~A}(; \mathrm{B}))>$.

- if 2 elsewhere, Black wins at $C$ \# A/1 is met by White 1 .

One can usually make the seed of Four after playing an unbroken Three on $15 \times 15$-boards, but this method cannot be used on $6 \times 6$-boards in general. In this problem Black forces White to block at the edge as seen in [A04], so he makes the seed of Four and increases his potential power.

[A14 Ans] Black wins by $\langle 3 \rightarrow(\mathrm{~A} ; \mathrm{B})\rangle$.

- if 2 elsewhere, Black wins by $\langle\mathrm{C} \rightarrow \mathrm{D}\rangle$ \# C/ 1 is met by White e, and next f by White g . C/3 is met by White 4 -move ( g or h ) followed by 3. Black 4 -move A makes him lose victory.

[A15 Ans] Black wins by $\langle 3 \rightarrow(\mathrm{~A} ; \mathrm{B})>$. White 4-move against 3 is ineffective.
- if 2 elsewhere, Black wins by $\langle 3 \rightarrow A>$ \# Both $\mathrm{A} / 1$ and $\mathrm{A} / 3$ are met by White B .

[A16 Ans] Black wins by $\langle 5 \rightarrow(A ; B)>$. White 4 -move against 5 is ineffective.
- if 4 elsewhere, Black wins at A
- if 2 elsewhere, Black wins by $\langle 3 \rightarrow(A(; B))>$


## 3 Middle Level VCT Problems


[B01(cooz) ${ }^{\text {] }}$ Black to play and win.
Hint: The correct sequence is not 'Three followed by 4-3'. It seems rather easy to look ahead in spite of long sequence. Play 3 -move or 4 -move if necessary for not suffering Nori-move.

[B03(co10) ${ }^{2}$ White to play and win.
Hint: White applies one of his privileges.

[B04(co04)] Black to play and win.
Hint: It seems easy, but White has good defenses. Calculate better moves than such defenses.

Note that there are always three moves for blocking Three on $6 \times 6$-boards.

[B01 Ans] Black wins by $\langle 7 \rightarrow$ A $>$.

- if 4 elsewhere, Black wins by ( $4 ; \mathrm{B} ; \mathrm{A}$ )
- if 2 elsewhere, Black wins by $(2 ; C)$
\# 2/1 is met by White 1 and $7 / 1$ by 1 -etc. Double-Mise-move 7 without 4 -move 5 is met by White 5 .

[B02 Ans] Black wins by $<3 \rightarrow A$ or $(B ; C)$ or (A;D;B;C;E)>.
The strongest defense against 3 is $f$.
- if 2 elsewhere, Black wins at A
\# B/1 is met by White 1 .

[B03 Ans] White wins by $\langle 1 \rightarrow \mathrm{~A}$ or ( $\mathrm{A} ; \mathrm{B} ; \mathrm{C} ; \mathrm{D} ; \mathrm{E})\rangle$. The VCF against White $f$, the strongest defense, forces Black to make forbidden Overline at X .

Trapping Black into Overline is the point of this problem.

[B04 Ans] Black wins by $<1 \rightarrow \mathrm{~A}$ or B or (C;D;A (;E))>.
\# $\mathrm{B} / 1$ is met by White f -etc, $\mathrm{D} / 1$ by C and $\mathrm{E} / 1$ by 1 . Did you find such strong defenses as $f, g$ and $h$ against 1 , and correct sequences after those defenses?

[ $\left.\mathbf{B 0 5}_{(\text {c047) }}\right]$ Black to play and win.
Hint: Select one from the possible candidates for the first move, so that it yields successful link between left side and right side.

[ $\mathbf{B 0 6}_{(\mathrm{c} 008)}$ ] Black to play and win.
Hint: Black can win by simply making some Threes. Is it true?

[ $\left.\mathbf{B 0 7}_{(\mathrm{c} 044)}\right]$ Black to play and win.
Hint: There are two fake 'Three followed by 4-3' sequences, which suffer White Nori-move. Consider how to avoid Nori-move.

[B08(c031)] Black to play and win.
Hint: Impossible to make 4-3 immediately. Be careful that White may have chances of 4-move on vertical and horizontal lines.

[B05 Ans] Black wins by $\langle 3 \rightarrow \mathrm{~A}$ or B$\rangle$.

- if 2 elsewhere, Black wins by ( $\mathrm{B} ; \mathrm{D} ; 3 ; \mathrm{A}$ ) or $<C \rightarrow(2 ; E)>$
\# 3/1 is met by White D. Both 'A followed by 3 '/1 and ' $B$ followed by 3 '/1 are met by White $D$ after 3 .

[B06 Ans] Black wins by $<3 \rightarrow \mathrm{~A}$ or $(\mathrm{A} ; \mathrm{B} ; \mathrm{C} ; \mathrm{D})>$. The strongest defense against 3 is e.
- if 2 elsewhere, Black wins by $\langle 3 \rightarrow$ A $>$

Skillful usage of edge lines is often important on small boards.

[B07 Ans] Black wins by $\langle 3 \rightarrow(A(; B))\rangle$.

- if 2 elsewhere, Black wins at A \# $A / 1$ is met by White $B$ and $3 / 1$ by $c$.

[B08 Ans] Black wins by $\langle 3 \rightarrow$ A>.
Black could win by 'A followed by 3 ' $/ 3$, but it needs one more Black move though the same winning pattern.
- if 2 elsewhere, Black wins at A
\# B/1 is not a Threat. Neither is D after 4-move C. $C / 3$ makes spot $B$ into forbidden 4-4.

[ $\left.\mathbf{B 1 0}_{(\text {co40 })}\right]$ Black to play and win.
Hint: Determine the first move by looking-ahead. Left, right, or upper?

[B11 ${ }_{\text {(co28) }}$ ] Black to play and win.
Hint: Hopeful moves will suffer Nori-move more or less. Which sequence overcomes Nori-move?

[B12(co07) $]$ Black to play and win.
Hint: Wrong order of moves causes effective defenses. You should not be too nervous about White 4-move.

[B10 Ans] Black wins by $\langle 3 \rightarrow(A ; B)\rangle$.
- if 2 elsewhere, Black wins by $(\mathrm{C} ; 3)$ or $<\mathrm{D} \rightarrow \mathrm{B}$ or E>
\# $B / 1$ is met by White $f$-etc, and next $C$ and $A$ are met by White $A$ and $C$-etc respectively. $A / 1$ is met by White C-etc, C/ 1 by A-etc, $3 / 1$ by g and $A / 3$ by 3 .

[B11 Ans] Black wins by $<3 \rightarrow((\mathrm{~A} ;) \mathrm{B} ; \mathrm{C})>$.
White 4-move against 3 is ineffective.
- if 2 elsewhere, Black wins by $<\mathrm{B} \rightarrow(3(; 2))$ or (D;3;E)>
\# $3 / 1$ is met by White $E$, and next 1 and $B$ are met by White block on right edge. $\mathrm{B} / 1$ is met by White C and $\mathrm{C} / 1$ by B .

[B12 Ans] Black wins by $\langle 5 \rightarrow(A ; B)\rangle$.
Black could win by 'A followed by 5 ' $/ 5$, but it needs one more Black move though the same winning pattern.
- same wherever 4
- if 2 elsewhere, Black wins in the same way, or wins by (C;D;4)
\# $3 / 1$ is met by White 4 , and next 1 followed by 5 is met by White e followed by f .

$\left[\mathbf{B 1 3}_{(\mathrm{c} 035)}\right]$ Black to play and win.
Hint: Select the moves by which Black can win even if White plays Nori-move. This is similar to [A13], but more difficult.

[B14(c024) ${ }^{\text {(che }}$ Black to play and win.
Hint: Four followed by 4-3 is not correct. Find another sequence.

[ $\mathbf{B 1 5}_{(\mathrm{c} 015)}$ ] Black to play and win.
Hint: There exists a forbidden spot of 4-4. Black turns it to his advantage.

[ $\left.\mathbf{B 1 6}_{(\mathrm{co14)}}\right]$ Black to play and win.
Hint: There are several hopeful sequences, and also Nori-move. Be careful about the order of moves.

[B15 Ans] Black wins by $\langle 1 \rightarrow(A ; B)$ or $(C ; D ; E ; B)>$, where Black makes Four and horizontal Three at the same time but at the different spots.
$\# A / 1$ is met by White $f$ and $E / 1$ by 1 .

[B16 Ans] Black wins by $\langle 3 \rightarrow(\mathrm{~A} ; \mathrm{B})>$. White 4-move against 3 is ineffective.
- if 2 elsewhere, Black wins by ( $2 ; \mathrm{A} ; \mathrm{C}$ ) \# $3 / 1$ is met by White $\mathrm{d}, \mathrm{B} / 1$ by e and $2 / 1$ by 1 .


## 4 Advanced Level VCT Problems


[ $\left.\mathbf{C 0 1} 1_{\text {(сооз) }}\right]$ Black to play and win.
Hint: The solution is VCF after 3. But another solution, VCF after 5, exists. This problem has interesting features and is defective.

[C02 ${ }_{(\text {coove })}$ ] Black to play and win.
Hint: The first move is excellent. You must prepare winning sequences such as VCF against White defenses.

[ $\mathbf{C 0 3}$ (co41) ] Black to play and win.
Hint: Make effective use of limited candidates of Threat.

[C04(co29)] Black to play and win.
Hint: Both Black and White play very well.

[C01 Ans] Black wins by $<3 \rightarrow(A ; B)$ or (C;D;E;F;G)>.

- if 2 elsewhere, Black wins at 2
\# $\mathrm{B} / 1$ is met by White $\mathrm{i}, \mathrm{H} / 1$ by i and $\mathrm{E} / 3$ by 3 .

Another solution is 'Black C, White 2, Black D, White defense, Black G' followed by VCF of length two or three.

[C02 Ans] Black wins by $\langle 3 \rightarrow A>$.

- same if $\mathrm{B} / 2, \mathrm{C} / 2$ or e/2.
if $f / 2, g / 2$, $h / 2$ or $i / 2$, Black wins by ( $B ; 2 ; A ; D$ ).
if $\mathrm{j} / 2$, Black wins by ( $B ; 2 ; A ; D ; 3$ ).
if 2 elsewhere, Black wins by $(\mathrm{B} ; \mathrm{C})$
\# $3 / 1$ is met by White $D$ and $A / 1$ by 1 -etc.
Black 1 is Fukumi-move of $(B ; C)$ and so on. There are many defenses, and it is rather difficult to consider all variations. White 2 in the figure seems weaker since we can easily find out $\langle 3 \rightarrow A\rangle$. But it is regarded stronger in the 'Renju problems' field, because many other defenses don't cancel VCF.

[C03 Ans] Black wins by $\langle 5 \rightarrow \mathrm{~A}$ or B$\rangle$.
$<A \rightarrow(5 ; B)>$ after 4 is also possible.
- same wherever 4
- if $4 / 2$, Black wins by $\langle\mathrm{C} \rightarrow$ D>
( $\langle\mathrm{D} \rightarrow \mathrm{C}\rangle$ is also possible).
if 2 elsewhere, Black wins by (2;D)
\# Both $\mathrm{A} / 3$ and $5 / 3$ are met by White e. Both $\mathrm{B} / 3$ and $B / 5$ are met by White $f$.

[C04 Ans] Black wins by $\langle 5 \rightarrow \mathrm{~A}$ or $(\mathrm{B} ; \mathrm{C})$ or ( $\mathrm{D} ; \mathrm{E}$ ) $>$.
- if 4 elsewhere, Black wins at F , or wins by $(\mathrm{G} ; \mathrm{B} ; \mathrm{C} ; \mathrm{D} ; \mathrm{E})$ or $(\mathrm{G} ; \mathrm{B} ; \mathrm{C} ; \mathrm{F} ; 4)$
- if 2 elsewhere, Black wins at $F$ \# C/5 is met by White G.

[ $\left.\mathbf{C 0 5} \mathbf{5}_{\text {(cозз) }}\right]$ Black to play and win.
Hint: It requires rather long sequence but has not many variations. Be careful until winning 4-3.

[ $\left.\mathbf{C 0 6}{ }_{(\text {co45 })}\right]$ Black to play and win.
Hint: Attack so that the effect of White 4-move is nullified.

[ $\left.\mathbf{C 0 7} 7_{\text {(c042) }}\right]$ Black to play and win.
Hint: There is a forbidden spot of 4-3-3. Find out the way to change it to 4-3.

[C08(c012)] White to play and win.
Hint: White tries to trap Black into a forbidden move. Although it seems easy, you should be careful sufficiently about Black defenses and the order of moves.

[C05 Ans] Black wins by $\langle 7 \rightarrow(A ; B)$ or $(A ; B ; C ; D)>$.
- if 2 elsewhere, Black wins by ( $\mathrm{E} ; 7$ ) or $(2 ; \mathrm{F} ; 4 ; \mathrm{D})$ \# $3 / 1$ is met by White E .

[C06 Ans] Black wins by $\langle 5 \rightarrow(\mathrm{~A} ; \mathrm{B})>$.
White 4 -move instead of 2 or 4 is ineffective.
- if 4 elsewhere, Black wins in the same way, or wins by ( $\mathrm{D} ; \mathrm{C}$ )
- if 2 elsewhere, Black wins by $\langle\mathrm{C} \rightarrow(\mathrm{D} ; 4 ; 2)>$
\# 2/1 is met by White 1 , and next 4 and $A$ are met by White $C$ followed by e and B-etc respectively. $\mathrm{A} / 1$ is met by White 1 , and next 4 by White e. $3 / 1$ is met by White $A$ followed by $4,4 / 1$ by e-etc, $A / 3$ by 3 and $5 / 3$ by C followed by e.

[C07 Ans] Black wins by $\langle 5 \rightarrow A\rangle$, where $A$ is either open Four or 4-3.
- if 2 elsewhere, Black wins by $(A(; 2))$, or wins at B or 3
\# 3/1 is met by White 1 .

Note that Black 1 not only aims to make 4-3 at B but also changes spot $A$ to 4-3 because spot 3 is $4-4$ after $A$ is played.

[C08 Ans] After 9, Black is forced to make forbidden 4-4 at X. Black 4-move against 5 is ineffective.

- if 6 elsewhere, White wins by $(A ; 6 ; 9)$
- if 4 elsewhere, it is easy to force Black to make 3-3 at 6
- if 2 elsewhere, to force $3-3$ at 6 is easy
\# 3/1 is met by Black b.
Note that there appear 4-3, 3-3 and 4-4 in the variations.


## 5 VCF Problems


[D01(dooз) ] Black to play and win by continuous Fours. Hint: As said repeatedly, be careful about Nori-move.
[D02 (doou) ${ }^{2}$ Black to play and win by continuous Fours. Hint: White might make his own 4-3, but don't worry about it. VCF sequence is 6 in length.

[D03(dooz) ${ }^{\text {D }}$ Black to play and win by continuous Fours. Hint: Choose correct branch road, and avoid White Nori-move. VCF sequence is 7 in length.

[D04(doou)] Black to play and win by continuous Fours. Hint: VCF sequence is 8 in length. It may not be so easy to look ahead without putting stones.

[D01 Ans] Black wins by $(1 ; 2 ; \ldots ; 6)$.

The solution is a straight-line sequence except at 3 .

[D02 Ans] Black wins by $(1 ; 2 ; \ldots ; 6)$.

White makes 4-3 when he blocks against 5, and Black also makes 4-3 at 6 while blocking White's 4-3.

[D03 Ans] Black wins by $(1 ; 2 ; \ldots ; 7)$.

Black can win even if $A / 6$. But $A$ is an unnecessary move.

[D04 Ans] Black wins by $(1 ; 2 ; \ldots ; 8)$.

The spot of final 4-3 might surprise you.

## References

[1] Mano,Y.: "Introduction to $6 \times 6$-Board Renju Problems (1)\&(2)", The Renju Sekai, Vol. 57 No.11\&12, Nov.\&Dec. 2011 (in Japanese).
[2] Web site on $6 \times 6$-Board Renju Problems, http://www016.upp.so-net. ne.jp/TokaiRenju2/JirTa/xxx (where $\mathrm{xxx}=6 \mathrm{x} 6 \mathrm{~J} . \mathrm{htm}$ in Japanese, or 6x6E.htm in English).
[3] Mano,Y.: "6×6-Board Renju Problems-Collection-1", Tokai Renju Association in Japan, Nov. 2011 (2nd ed. Dec.2012) (in Japanese).
[4] Mano,Y.: "6×6-Board Renju Problems-Collection-2~5", Tokai Renju Association in Japan, Mar.~Dec. 2012 (in Japanese).

Solution to the front cover problem


After 3, Black wins by 4-3 at A.
If b instead of 2, Black plays A and wins by 4-3 at 3 .


[^0]:    ${ }^{1}$ The mark 'cxxx' in brackets is the problem identifier used in Web site.

[^1]:    ${ }^{2}$ Paragraph following ' $\#$ ' is some annotation on the attacker failure moves.
    3 The description on variations assumes White will block Three and Mise-move. If White does not block them, Black makes open Four or 4-3, of course.

[^2]:    4 'Ineffective 4-move' means the defense 4-move, which makes new attacker's Threat and makes impossible to defend against both existing and new Threats at the same time.
    ${ }^{5}$ The suffix '-etc' is appended, if there exist other effective defense moves.

[^3]:    ${ }^{6}$ If one or more extra 4-moves are necessary depending on defenses, the VCF sequence is represented using nested parentheses like ' $(A ; B(; C))$ '.

    7 Although other defenses instead of 2 and 4 make the VCT sequence longer, the above expression is used in order to simplify the description.

