

1. You are given two games g and h and asked to prove that $g \equiv h$. There are two common methods to do this: describe one method (your favorite of the two).

• PROVE $g + -h \in \mathcal{P}$

• USE CANONICAL FORM TH'M :

SHOW $cf(g) = cf(h)$

2. Recall: $ox4* = oxox\ ox$

$ox12 = oxoxoxoxox$

$ox12 \equiv ox4* \equiv \pm\{0, \uparrow*\}$.

Notice that $g = oxoxo + xxoxox$ is a left option of $ox12$, and that $h = ox + xxoxox$ is a right option of g . The canonical form of $xxoxox$ is $\{*, \uparrow | \downarrow, \downarrow*\}$. The canonical form of h is $\{0, \uparrow* | \downarrow, \downarrow*\}$. Confirm that the left options of the canonical form of h are 0 and $\uparrow*$.

L-OPTIONS OF h

• $xx6$

• $ox\ xx\uparrow = ox\ xxox \equiv * \downarrow* \equiv \downarrow$

• $ox\ xx0 = \uparrow*$

• $ox\ ox \equiv \emptyset$

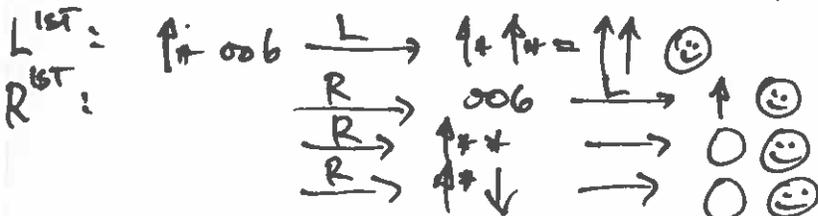
• $ox\ xxoxx = ox\ xx0 \equiv \uparrow*$

PRUNE: $\downarrow < \emptyset$ so PRUNE \downarrow

PRUNE: $xx6 < \uparrow*$ so PRUNE $xx6$

CAN'L L-OPTIONS OF h ARE $\{\emptyset, \uparrow*\}$

CLAIM $\uparrow* + oob \in \mathcal{L}$ $oob \equiv \{\uparrow, \uparrow* | \downarrow, *\}$



□ CLAIM

3. According to CGSuite, the outcome class of $ox12 - h$ is \mathcal{L} . Circle which of the following is

true: $h < ox12$

$h > ox12$

$h \parallel ox12$

$h \equiv ox12$

$$ox12 - h > \emptyset \quad \text{IFF} \quad ox12 - h + h > \emptyset + h \quad \text{IFF} \quad ox12 > h \quad \text{IFF} \quad h < ox12$$

4. You are player Left. You are playing clobber. One part in the game is $ox12$. Among all your move options on that part, is playing to g always a best option? Prove or disprove.

YES. FROM 2: $ox12 \equiv \pm\{\emptyset, \uparrow\}$ ← 2 L-OPTIONS: \emptyset, \uparrow
2 R-OPTIONS: \emptyset, \downarrow

IS PLAYING $ox12 \xrightarrow{L} ox5 + xx6$ AT LEAST AS GOOD FOR L

AS PLAYING $ox12 \xrightarrow{L} \dots \rightarrow \emptyset$?
... AS PLAYING $ox12 \xrightarrow{L} \dots \rightarrow \uparrow$?

IS $ox5 + xx6 > \emptyset$? } YES. TO FINISH PROOF,
IS $ox5 + xx6 > \uparrow$? } SHOW THESE TWO FACTS

HW3 #5

a) $\downarrow + < \text{OX8}$

b) $\text{OX8} \equiv \pm \{ \text{OX5}, \text{OX4} \uparrow \}$

HINT $\text{XX7} \equiv \{ \uparrow \mid \downarrow, \pm \{0, \uparrow\} \}$

WARMUP

$\uparrow \equiv \{ \emptyset \mid * \}$

$\uparrow * \equiv \{ \emptyset, * \mid \emptyset \}$

$\text{OX5} \equiv \{ \uparrow \mid * \}$

$\text{OX5} \downarrow \equiv \{ \emptyset \mid \downarrow + \} > \emptyset$

$\uparrow [2]$
 $\text{XX5} \equiv *$
 $\text{OX6} \equiv \emptyset$

$\forall t \geq 2 \quad t \cdot \uparrow \equiv \{ \emptyset \mid (t-1) \uparrow * \} > \emptyset$

" $t \cdot \uparrow * \equiv \{ \emptyset \mid (t-1) \uparrow \} > \emptyset$

$\text{OX4} \equiv \pm \{ \uparrow, * \}$
 $\text{OX4} * \equiv \pm \{ \uparrow, \emptyset \}$

$\text{XX6} = \text{XXOXOX} \equiv \{ *, \uparrow \mid \downarrow, \downarrow * \}$

OX8 L-OPTIONS

- $\text{OX6} \equiv \emptyset$
 - $\text{OXK OXOX} \equiv \text{OX4} \uparrow$
 - $\text{OXOXK OX} \equiv * * \equiv \emptyset$
 - XX7
 - XX6
 - $\text{OXO XXOX} \equiv * \downarrow * \equiv \downarrow$
 - OX5
- ← PRUNE $\emptyset < \text{OX5}$
- ← PRUNE $\downarrow < \emptyset$

NOW PROVE a). WTS $\text{OX8} \uparrow * > \emptyset$ 😊

L1: $\text{OX8} \uparrow * \xrightarrow{L} \text{OX5} \uparrow * > \uparrow \uparrow * > \emptyset$ 😊

L2: $\text{OX8} \uparrow * \xrightarrow{R} \text{OX8} \xrightarrow{L} \text{OX5}$ 😊

$\text{OX4} \downarrow \uparrow * \xrightarrow{L} \emptyset$ 😊

$\text{OO7} \uparrow * \xrightarrow{L} \uparrow * \uparrow *$ 😊

$\text{OO6} \uparrow * \xrightarrow{L} \uparrow * \uparrow *$ 😊

$\text{XOXOX} \uparrow * \xrightarrow{L} \downarrow * \uparrow *$ 😊

□ a) 😊

NOW PROVE b) XX7 : R REVERSES TO $\downarrow *$, $\downarrow *$ LESS THAN OX8 ,
 L-OPTIONS OF $\downarrow *$ JUST \emptyset , NOW PRUNE \emptyset

XX6 : AGAIN R REVERSES TO $\downarrow *$

CONCLUSION: ONLY REMAINING L-OPTIONS $\text{OX4} \uparrow, \text{OX5}$
 $\text{OX8} \equiv \pm \{ \text{OX4} \uparrow, \text{OX5} \}$ ▮ b)