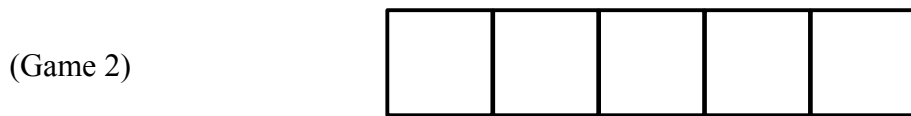


Pauley is evaluating some Toads & Frogs boards for her graduate-level combinatorial games class. Unfortunately, she is not entirely clear how to evaluate them, so she comes to you for help. In this assignment, fill in the details she has left out!

She is asked to evaluate the following game board:

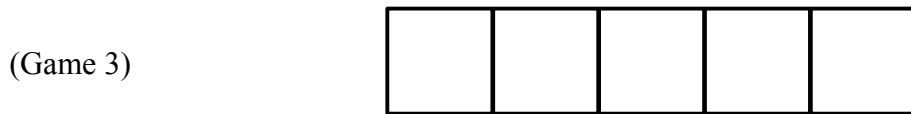


She sees that there is one child for each player. What is the only move option for the Right player?



This game only has moves for which player? _____

What is that option?



Since there are no more jumps, Pauley believes the value of this game can be found just by counting each player's remaining possible moves and finding the sum (counting Right's as negative). Do you agree or disagree with this? Why?

What is the value of this game? (You should find a number value) Why?

Now that you've found the value of Game 3, what is the value of Game 2?

$$\{ \quad | \quad \} = \underline{\hspace{2cm}}$$

Which Theorem or Definition did you just tell Pauley to use to evaluate the set notation for Game 2?

To evaluate Game 1, we still have some subgames to recursively evaluate. What is the only move option for the Left player from Game 1?

(Game 4)



What is the option for the Left player from this game?

(Game 5)



Pauley wants to use either the Simplest Number Theorem or Negatives to evaluate Game 5, but she refuses to evaluate any subgames. (She is cool with looking back at previous games.) Which should Pauley use, and why?

What is the value?

What is the Right option from Game 4?

(Game 6)



Finding this value is very simple. Why is it so easy?

What is the value?

Now, what is the value of Game 4?

$$\{ \quad | \quad \} = \underline{\hspace{2cm}}$$

Which Theorem/Definition/Property did you just use?

And Game 1?

$$\{ \quad | \quad \} = \underline{\hspace{2cm}}$$

Which Theorem/Definition/Property/etc did you just use?

Which outcome class is Game 1 in? How do you know?

Pauley then declares that the negative of Game 1 is equal to this:

F		T		
---	--	---	--	--

Do you agree or disagree? If you disagree, please give the correct negative in the boxes below:

--	--	--	--	--

Pauley wanted to find the value of Game 1, and not just the outcome class so that she could add it to the following game and find the sum.

(Game 7)

F	F	T		F
---	---	---	--	---

You are very smart and already see the value of this game, but Pauley says “Hush!” and starts going through the steps.

What is the left option to this game?

(Game 8)

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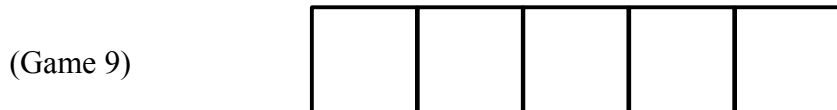
Find the options for Game 8 on your own, and their values. Based on that work, what are on the right and left sides of the set notation for Game 8?

$$\{ \quad | \quad \}$$

Which outcome class is this game in? Why?

“Oh, that's an easy one!” Pauley exclaims. I know the value of that game! What is the value of Game 8?

What is the right option for Game 7?



What is the value of this game? How do you know?

Thus, what is the set notation and value of Game 7?

$$\{ \quad | \quad \} = \underline{\hspace{2cm}}$$

You tell Pauley you know this is true because of the Definition of ____.

Is Game 7 a number? Which outcome class is it in? What is the value of the sum of Games 1 and 7? Is that sum a number? Which outcome class is the sum in? Why? (Yeah, six pieces! Don't forget one!)

Pauley scribbles on some paper for a few minutes, then declares that the sum of Games 1 and 7 is equivalent to $\{ \mathbf{1} \mid \mathbf{1} \}$. Is she correct? Why or why not? (You may need extra space; there are multiple steps/parts to this!)