

This assignment is due at the beginning of class on Wednesday, February 12. Please bring a neat, legible hard copy of your work with you to class. If your homework is multiple pages long, please staple the pages in the correct order.

Homework guidelines: While you are welcome to discuss the homework problems with your classmates and you are strongly encouraged to seek help from me, after discussing the problems with others, you must write your own solutions. On work you turn in, you should acknowledge your collaborators by writing their names next to any problems you discussed with them. Write clearly and neatly (or type), giving thorough solutions that could be understood well by your classmates. Note that carefully communicating a solution is one of the most important parts of mathematics: if we can't convince others that our solution is correct, then our solution will not be accepted by the mathematical community.

After each solution, write a few sentences about your solution process: what was clear to you from the beginning, what did you have to think about more, what approaches did you take, what virtues of the ones we've discussed in *Math for Human Flourishing* did you feel were cultivated as you thought the problem and wrote your solution, etc. You do not need to answer all of these questions, but you should give a thoughtful explanation. **Solutions without a sufficient reflection will earn an R.**

1. Suppose Paolo and Nellie are playing Integer Tic Tac Toe. Paolo is playing positives and Nellie is playing negatives. They've reached the following point:

	3	-1
	1	
	-1	

Draw a game tree for the game from this point on and explain the choices you have to make along the way.

2. Now suppose that Paolo and Nellie are playing another game of Integer Tic Tac Toe and they've reached this point:

		-1
-1	1	2

- (a) If Paolo is playing rationally, what moves can he eliminate as options for his next move? Explain.
 - (b) Choose one of Paolo's rational moves and draw the game tree from that point on for this game.
3. In yet another game of Integer Tic Tac Toe, Paolo and Nellie have reached this point:

-1		
	1	
		2

- (a) Up to symmetry, how many moves does Nellie have at this point?
- (b) If Nellie is playing rationally, what moves can she eliminate as options for her next move? Explain.
- (c) What will happen with the rest of this game if both players play rationally from this point on? Explain.