

This assignment is due at the beginning of class on Wednesday, January 29. 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. In the following partially-played tic-tac-toe game, which of the players, if either, has the advantage, i.e., has a set of moves that will guarantee a win? If someone has the advantage, how should that player proceed for each remaining move in order to win the game? If no one has an advantage, explain why not and how the game could be played out to a tie.

X		O
	O	
		X

2. In the following partially-played tic-tac-toe game, where should O play next? How will the game proceed from there for each remaining move? Explain each of the options.

X		
O		
		X

3. For the following partially-played tic-tac-toe game, which moves is O hoping X will make next? Explain why, including what will happen as the games play out in each of those cases.

X		
O		