

# Econ 327: Game Theory

## Homework #1

University of Oregon

Due: Oct. 3<sup>rd</sup>

Question:	Question 1	Question 2	Question 3	Total
Points:	8	8	8	24
Score:				

### For homework assignments:

- Complete *all* questions and parts.
- You will be graded on not only the content of your work but on how clearly you present your ideas. Make sure that your handwriting is legible. Please use extra pages if you run out of space but make sure that all parts of a question are in the correct order when you submit.
- You may choose to work with others, but everyone must submit to Canvas individually. Please include the names of everyone who you worked with below your own name.

Name \_\_\_\_\_

**Question 1.** Consider a (heavily) simplified version of the popular board game *Catan*. In this version, there are only five map tiles numbered one through five. There are two players, Andy and Booth, and each has two settlements placed on a tile. Andy's settlements are on tiles 1 and 2 and Booth's settlements are on tiles 3 and 4. On a players' turn, they roll a single fairly weighted die and if it lands face up on a number which matches the tile of one of their settlements, they earn one sheep card. However, if the die lands on a 6, then the player who rolled it can steal one sheep from their opponent.

Suppose that it is Andy's turn to roll the die.

- (a) [4 points] What is Andy's expected payoff (in sheep)?
- (b) [4 points] What is Booth's expected payoff?

**Question 2.** Watch the clip from the British Game show Golden Balls. [https://youtu.be/b0wh9\\_1AeLA](https://youtu.be/b0wh9_1AeLA) The specific game is called Golden Balls and is played between the two contestants after they have collected a pool of prize money together in other challenges.

Respond to the following questions about the game and briefly justify each answer.

- (a) [2 points] Do the players take their actions *sequentially* or *simultaneously*?
- (b) [2 points] Is Golden Balls a *zero-sum* or a *constant-sum* game?
- (c) [2 points] What relevant *information* is available to the players when taking their actions?
- (d) [2 points] How important is the stage where the contestants are told to talk with each other? Can communication be strategic?

**Question 3.** Read the 2022 Politico Opinion article, *How Game Theory Explains Why We Have to Sanction Putin : Even If It's Costly*.

<https://www.politico.com/news/magazine/2022/04/21/russia-sanctions-game-theory-00026566>

- (a) [4 points] List the tools from game theory that we've learned about in class which the authors use to argue their point.
- (b) [2 points] What assumptions do the authors make in their simplified 'Repeated Sanctions Game'?
- (c) [2 points] Do you find the authors' arguments convincing? Why or why not?