

Math 1001 Quiz 6 Solutions

1. (8 points, 2 points each) True or false.

- TRUE Whether or not a player gets a “fair share” depends only on how valuable they think it is, and not on how valuable anyone else thinks it is.
- FALSE If there are four people dividing a cake, then a “fair share” is any piece that is worth at least 20% of the cake.
- FALSE Suppose three rats are dividing a heap of garbage using the lone-divider method. If the first “chooser” rat thinks that the three piles are worth 40%, 35%, and 25% of the heap, then it bids on only the biggest heap.
- TRUE Suppose four people are dividing a sandwich between themselves using the lone-chooser method. First three people divide the sandwich evenly between themselves, and then each of them cuts their share into 4 pieces.

The next questions all refer to the following problem.

Suppose we have 4 cups of orange juice and 4 cups of cola which we are trying to divide between 4 people: Wanda, Xavier, Yolanda, and Zach. Here are some possible shares of the liquid:

- (a) One cup orange juice, one cup cola.
- (b) One cup orange juice, two cups cola.
- (c) Two cups orange juice, one cup cola.
- (d) One cup orange juice, no cola.
- (e) No orange juice, three cups cola.

2. (3 points) If Wanda likes orange juice and cola equally, which of the above shares does she consider “fair”?

Wanda considers a, b, c, and e fair.

3. (3 points) If Xavier only likes orange juice, which of the above shares does he consider “fair”?

Xavier considers a, b, c, and d fair.

4. (4 points) If Zach likes orange juice twice as much as cola, which of the above shares does he consider “fair”?

Zach considers a, b, c, and e fair.

5. (3 points) Yolanda only likes cola. If we are using the last-diminisher method and, in the first round, Yolanda gets share (b), name **two** possible ways she could diminish it to what she thinks is a fair share.

Two possibilities: She could diminish to one cup orange juice and one cup cola, or no orange juice and one cup cola.