Quiz 14 Solutions

1. A group of three friends are sharing a passover meal. Their values for the components of the meal:

	Motzah	Latkes	HB Eggs
A	1/4	0	3/4
B	2/3	1/3	0
C	1/6	1/2	1/3

2. Consider the following two cuts

   (a) Give A all the Hard Boiled Eggs and split the Motzah and Latkes evenly (in half) between B and C. What is each players value for <u>their own slice</u>?   (2 pts)

   $$B \text{ thinks } B \text{ gets} = \frac{2}{3} \times \frac{1}{2} + \frac{1}{3} \times \frac{1}{2} = \frac{1}{2}$$
   $$C \text{ thinks } C \text{ gets} = \frac{1}{6} \times \frac{1}{2} + \frac{1}{2} \times \frac{1}{2} = \frac{1}{3}$$

   $$A: 3/4 \qquad B: 1/2 \qquad C: 1/3$$

   (b) Give A all the HB Eggs, give B all the Motzah, and give C all the Latkes. What is each players value for <u>their own slice</u>?   (2 pts)

   $$A: 3/4 \qquad B: 2/3 \qquad C: 1/2$$

3. Is one of cuts (2a) or (2b) objectively better than the other? (1 pt)   <u>Circle One:</u>   Yes   No

4. From your work above, can you conclude that cut (2a) is pareto-optimal? (1 pt)

   <u>Circle One:</u>   Yes   No

5. From your work above, can you conclude that cut (2b) is pareto-optimal? (1 pt)

   <u>Circle One:</u>   Yes   No

   Our work above ONLY SHOWS that cut 2a is NOT pareto-optimal. Cut 2b may or may not be pareto-optimal, but our work above does not show that - such a claim requires proof.

6. Circle T if the claim is true, F if the claim is false. (1 pt each)

   (a) Every equitable division is fair.   T   F

   (b) For the example above, the equal division is pareto-optimal.   T   F

   (c) Every pareto-optimal division is envy-free.   T   F

(a) See exercise 16.6

(b) Since A hates Latkes, giving $1/3$ of Latkes to A is a waste - an objective improvement would be to give all the Latkes to B or C. Thus the equal division is not pareto-optimal in this example.

(c) If you give one player everything, this is pareto-optimal, but it is NOT envy-free.