Homework 15: Chapters 13&14

Reading: Chapter 16 on Divisions: pages 122-124 for next Tuesday.

Book Exercises: 14.2 (Solutions)

Other Exercises: (Solutions)

1. Suppose there are four bidders A, B, C, and D with bids

$$a = 20 \qquad b = 16 \qquad c = 4 \qquad d = 8$$

and **A is the winning bidder**.

(a) Find q for this compensation arrangement.

(b) What is the equitable compensation arrangement?

(c) Consider instead the following compensation arrangement:

$$B \text{ wins, pays out } x_A = 5,\ x_C = 3,\ x_D = 5.$$

Construct the envy-table for this compensation arrangement. Find all instances of envy.

2. Prove: if the winning bidder A is a highest bidder and B, C are the only other bidders, then the compensation arrangement

$$x_B = \frac{a}{3} \qquad x_C = \frac{a}{3}$$

is envy-free.

Remark. Question 2 completes the proof of Our Proposition: An envy-free compensation arrangement is possible if and only if the winning bidder is a highest bidder.

Extra practice. There is an applet which constructs the fairness triangle available on the course webpage, with compatible exercise sheets (so far: one, two, and three).

I can also make an "envy-table generator" applet which would be available over the weekend. Such an applet would serve as a make and check your own example machine, which hopefully is helpful going into the next quiz and/or the final exam. If there is high demand for such a thing, shoot me an email and I'll make it a priority!