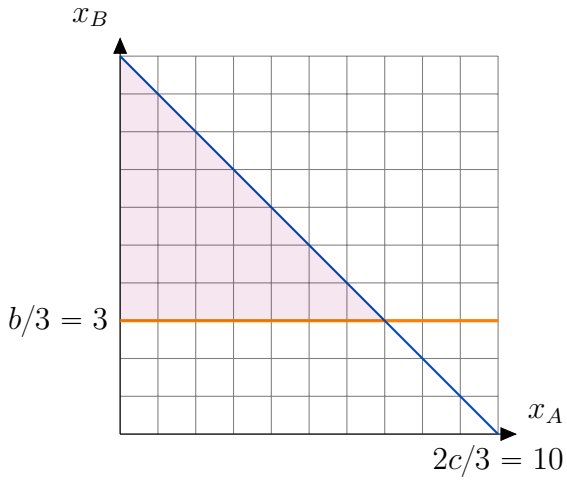
Quiz 10

The kids A, B, and C submit bids $\boxed{a = 18 \qquad b = 9 \qquad c = 15}$ for Dad's vintage bike.

1. Suppose C is the winning bidder. In the (x_A, x_B)-plane: Shade the region representing all compensation arrangements fair to BOTH B and C. Label your graph!!! (3 pts)



2. Suppose C is the winning bidder and the compensation amounts are $\boxed{x_A = 8 \qquad x_B = 4}$.

   (a) (2 pts) Compute the payout to the winner, C, given these compensation amounts:

   $$x_C = c - x_A - x_B = 15 - 8 - 4 = 3$$

   (b) (1 pt) Is this compensation arrangement fair? Circle One: Yes $\boxed{\text{No}}$

   (c) (1 pt) Define an equitable compensation arrangement for this example (with $N = 3$ and bids as above).

   For a compensation arrangement to be equitable, we need

   $$\frac{x_A}{18} = \frac{x_B}{9} = \frac{x_C}{15}$$

   (d) (3 pts) Is ~~this~~ the compensation arrangement from the beginning of Question 2 equitable? Explain. Show all work.

   Circle One: Yes $\boxed{\text{No}}$

   Explain.

   Here are two ways to do this problem correctly:

   i. Both A and B get the same proportion of their bids, because,

   $$\frac{x_A}{a} = \frac{8}{18} = \frac{4}{9} = \frac{x_B}{b}$$

   However, C does not get the same proportion of C's bid:

   $$\frac{x_C}{c} = \frac{3}{15} = \frac{1}{5} \neq \frac{4}{9}$$

   So this compensation arrangement is NOT equitable.

ii. We can also find q, and show that at least one player is not getting the q proportion of their bid. By our formula in class, we know q to be

$$q = \frac{w}{S} = \frac{15}{18 + 9 + 15} = \frac{15}{42}$$

Since, for example, $\frac{x_C}{c} = \frac{1}{5} \neq q$, we can conclude this compensation arrangement is not equitable.