Compensation Handout

Three math students (named A, B and C) share a book, and when class is over, have to decide who gets it. We'll look at 5 different possible compensation arrangements, and then compare them.

Suppose these are the values each student has for the book:

$a = \$18$ $b = \$24$ $c = \$30$

1) Suppose C gets the book and pays A and B each $2. What is C's payout?

    fair?   envy-free?

    equitable?   Pareto-optimal?

2) Suppose C gets the book and pays A and B each $8. What is C's payout?

    fair?   envy-free?

    equitable?   Pareto-optimal?

3) For an equitable and fair arrangement, who can get the book?
   Suppose B gets the book. Find an **equitable, and fair** arrangement.

      $X_A =$

      $X_B =$

      $X_C =$

    is this envy-free?   Pareto-optimal?

4) Find a **Pareto-optimal, fair, equitable** arrangement. Who gets the book?

$$X_A =$$

$$X_B =$$

$$X_C =$$

is this envy free?

is this an objective improvement over arrangement 3?

5) Find <u>all</u> Pareto-optimal, fair, and envy-free arrangements:

Pareto-optimal requires...
envy-free requires...

6) Looking at all the arrangements, there are two categories of better arrangements:

What arrangements were fair, Pareto-optimal, and equitable?

What arrangements were fair, Pareto-optimal, and envy-free?

Is a fair, Pareto-optimal, equitable, envy-free arrangement possible for this book?