

Chapter 13 homework solutions

1) $a = 500,000$ $b = 400,000$ A gets house, pays B, $200,000 \leq x_B \leq 250,000$

2) $a = 400,000$ $b = 360,000$ $c = 340,000$ $d = 320,000$

a) A gets house, $x_B = 90,000$
 $x_C = 85,000$
 $x_D = 80,000$
 $x_A = 145,000$

} This is one example,
 many others are possible.

b) B gets house, $x_A = 100,000$
 $x_C = 85,000$
 $x_D = 80,000$
 $x_B = 95,000$

} again, one of many possible
 answers

c) The average bid, M , is $\frac{400000 + 360000 + 340000 + 320000}{4} = \frac{1420,000}{4} = 355,000$

Since $c = 340,000 < M$, a fair arrangement is impossible if c gets the house.

d) Here are two of many possible envy-free arrangements:

A gets house, pays B, C + D each \$90,000.

	A	B	C	D
A Thinks	130	90	90	90
B "	90	↓	↓	↓
C "	70	↓	↓	↓
D "	50	↓	↓	↓

A gets the house, pays B, C + D each \$100,000

	A	B	C	D
A Thinks	100	100	100	100
B "	60	↓	↓	↓
C "	40	↓	↓	↓
D "	20	↓	↓	↓

5) $a = 90$ $b = 30$ $c = 0$

fair shares are 30 for A, 10 for B and 0 for C.

The referee decides $x_B = 10$, fair to B; $x_C = 5$, fair to C.

Then $x_A = 90 - 10 - 5 = 75$, fair to A.

6) (13.7) $a - 3x \geq a/4$ subtract a from both sides to get $-3x \geq -3a/4$ then divide both sides by -3 to get $x \leq a/4$, which is (13.6)