

Worksheet 8 (Fair Division 3): The Method of Sealed Bids

Group Names: _____

1. Jamal, Maggie, and Kendra are dividing an estate consisting of a house, a cabin, and a boat. Their valuations (in thousands) are shown below. We will use the method of sealed bids to determine the final allocation.

Their sealed bids are shown below. To determine the total allocation, we will fill in the various rows of the table. Instructions are below.

	Jamal	Maggie	Kendra
House	\$250	\$280	\$300
Cabin	\$170	\$200	\$255
Boat	\$50	\$40	\$45
Total bid	470	520	600
Fair Share	157	173	200
total value of won items	50	0	555
owed to estate			355
estate owes	107	173	
share of surplus	25	25	25
Final allocation	Boat + \$25 surp. + 107 from estate	173 from estate + 25 surplus	House + Cabin + \$25 owes \$355

- (a) Fill in the total amount bid by each person.
- (b) Fill in the Fair Share for each person: compute $(\text{total bid})/(\# \text{ of people})$.
- (c) Circle the winning bid for each item.
- (d) Enter the total value of all the “won” items.
- (e) For each person, compute $(\text{total value of won items}) - (\text{fair share})$. If the total value is more than the fair share, that amount is *owed to the estate*. If the total value is less than the fair share, then the estate owes you that much.

Jamal: $50 - 157 = -107$ (from estate) Maggie: $0 - 173 = -173$ Kendra: $555 - 200 = 355$

- (f) Compute $(\text{total amount owed to estate}) - (\text{total amount estate owes})$. This is the *total surplus*. Divide that quantity by the number of people to determine each person's surplus.

$$355 - (107 + 173) = 75 \quad \$ 75/3 = 25$$

- (g) Determine the final allocation. Make sure to list any items the person got, any money they are paid, and any money they pay in.

Jamal: gets boat, \$107 thousand from estate, and \$25 thousand

Maggie: gets \$173 + 25 = \$198 thousand

Kendra: gets house & cabin and pays $(355 - 25) = \$330$ thousand to the estate

2. (a) Fill in following table.

	Jamal	Maggie	Kendra
House	\$200 200	\$200 75	\$200 10
Cabin	\$100 200	\$100 75	\$100 10
Boat	\$50 200	\$50 75	\$50 10
Total bid	600	225	30
Fair Share	200	75	10
total value of won items	600	0	0
owed to estate	400		
estate owes		75	10
share of surplus	105	105	105
Final allocation	everything, pays \$295	gets \$180	gets \$115

- (b) Describe what happens when one person bids really high for everything and one person bids really low for everything.

Surplus = $400 - 85 = 315$. Jamal pays $400 - 105 = 295$.
 Jamal's total value is $600 - 295 = 305$.
 Kendra bid little and so gets less money than Maggie (because she valued things less.)

3. (a) Fill in the following table.

	Jamal	Maggie	Kendra
House	\$0	\$100	\$200
Cabin	\$300	\$100	\$100 50
Boat	\$0	\$100	\$50
Total bid	300	300	300
Fair Share	100	100	100
total value of won items	300	100	200
owed to estate	200	0	100
estate owes	0	0	0
share of surplus	100	100	100
Final allocation	Cabin, pay \$100	Boat, get \$100	House only

- (b) Describe what happens when one person bids a lot on just one item. in this situation

Surplus = 300. Notice here, the total bids are the same, just distributed differently. Jamal gets the cabin and has to pay, Maggie gets the boat and some cash, and Kendra only gets the house!