Alex, Blair, Charlie, and Devin won the trivia night and came away with three fabulous prizes: an all-you-can-eat dinner coupon, a clean t-shirt, and a USB charger. Hooray! Much happiness! Such joy! Except everyone felt they contributed equally and the prizes cannot be split amongst 4 people.

The trivia team decides to use side-payments to even up the division.

	Full			Own			Else		
	dinner	t-shirt	charger	dinner	t-shirt	charger	dinner	t-shirt	charger
Alex	\$14.00	\$8.00	\$5.00	\$3.50	\$2.00	\$1.25	\$10.50	\$6.00	\$3.75
Blair	\$18.00	\$12.00	\$9.00	\$4.50	\$3.00	\$2.25	\$13.50	\$9.00	\$6.75
Charlie	\$2.00	\$4.00	\$17.00	\$0.50	\$1.00	\$4.25	\$1.50	\$3.00	\$12.75
Devin	\$6.00	\$16.00	\$13.00	\$1.50	\$4.00	\$3.25	\$4.50	\$12.00	\$9.75
Average	\$10.00	\$10.00	\$11.00						

They use Knaster's method to decide who gets what and how much cash.

Blair gets the dinner, Devin gets the t-shirt, and Charlie gets the charger.

		dinner		t-shirt		charger		bonus		net
Alex gets paid	+	\$3.50	+	\$2.00	+	\$1.25	+	\$5.00	=	\$11.75
Blair pays	+	\$13.50	−	\$3.00	−	\$2.25	−	\$5.00	=	\$3.25
Charlie pays	−	\$0.50	−	\$1.00	+	\$12.75	−	\$5.00	=	\$6.25
Devin pays	−	\$1.50	+	\$12.00	−	\$3.25	−	\$5.00	=	\$2.25

1. In dollars, how much does Charlie thinks their own situation has improved? Show your calculation.

2. In dollars, how much does Charlie think Alex's situation has improved? Show your calculation.

3. Would Charlie prefer to get their own share (charger minus \$6.25) or Alex's share (\$11.75)?

4. Would Alex prefer to get their own share (\$11.75) or Charlie's share (charger minus \$6.25)?

Meanwhile in a parallel universe: Alex, Blair, Charlie, and Devin won the trivia night and came away with three fabulous prizes: an all-you-can-eat dinner coupon, a clean t-shirt, and a USB charger. Hooray! Much happiness! Such joy! Except everyone felt they contributed equally and the prizes cannot be split amongst 4 people.

The trivia team decides to use side-payments to even up the division.

	Full			Own			Else		
	dinner	t-shirt	charger	dinner	t-shirt	charger	dinner	t-shirt	charger
Alex	\$14.00	\$4.00	\$9.00	\$3.50	\$1.00	\$2.25	\$10.50	\$3.00	\$6.75
Blair	\$18.00	\$16.00	\$5.00	\$4.50	\$4.00	\$1.25	\$13.50	\$12.00	\$3.75
Charlie	\$2.00	\$8.00	\$17.00	\$0.50	\$2.00	\$4.25	\$1.50	\$6.00	\$12.75
Devin	\$6.00	\$12.00	\$13.00	\$1.50	\$3.00	\$3.25	\$4.50	\$9.00	\$9.75
Average	\$10.00	\$10.00	\$11.00						

They use Knaster's method to decide who gets what and how much cash.

Blair gets the dinner, Blair gets the t-shirt, and Charlie gets the charger.

		dinner		t-shirt		charger		bonus		net
Alex gets paid	+	\$3.50	+	\$1.00	+	\$2.25	+	\$5.00	=	\$11.75
Blair pays	+	\$13.50	+	\$12.00	−	\$1.25	−	\$5.00	=	\$19.25
Charlie pays	−	\$0.50	−	\$2.00	+	\$12.75	−	\$5.00	=	\$5.25
Devin gets paid	+	\$1.50	+	\$3.00	+	\$3.25	+	\$5.00	=	\$12.75

5. In dollars, how much does each person think their own situation improved?

6. In dollars, how much does each person think Devin's situation improved?

7. Who is envious of Devin's share? Calculate their perception of their share versus their perception of Devin's share.

8. Was there a simple way to make everyone happy with their own share?

These are all the perception calculations so you can see the variety.

	Full			Own			Else		
	dinner	t-shirt	charger	dinner	t-shirt	charger	dinner	t-shirt	charger
Alex	$14.00	$8.00	$5.00	$3.50	$2.00	$1.25	$10.50	$6.00	$3.75
Blair	$18.00	$12.00	$9.00	$4.50	$3.00	$2.25	$13.50	$9.00	$6.75
Charlie	$2.00	$4.00	$17.00	$0.50	$1.00	$4.25	$1.50	$3.00	$12.75
Devin	$6.00	$16.00	$13.00	$1.50	$4.00	$3.25	$4.50	$12.00	$9.75
Average	$10.00	$10.00	$11.00						

	dinner	t-shirt	charger	cash		net
Alex thinks Alex effectively got	− $3.50	− $2.00	− $1.25	+$11.75	=	+$5.00
Alex thinks Blair effectively got	+$10.50	− $2.00	− $1.25	− $3.25	=	+$4.00
Alex thinks Charlie effectively got	− $3.50	− $2.00	+ $3.75	− $6.25	=	−$8.00
Alex thinks Devin effectively got	− $3.50	+ $6.00	− $1.25	− $2.25	=	−$1.00
Blair thinks Alex effectively got	− $4.50	− $3.00	− $2.25	+$11.75	=	+$2.00
Blair thinks Blair effectively got	+$13.50	− $3.00	− $2.25	− $3.25	=	+$5.00
Blair thinks Charlie effectively got	− $4.50	− $3.00	+ $6.75	− $6.25	=	−$7.00
Blair thinks Devin effectively got	− $4.50	+ $9.00	− $2.25	− $2.25	=	+$0.00
Charlie thinks Alex effectively got	− $0.50	− $1.00	− $4.25	+$11.75	=	+$6.00
Charlie thinks Blair effectively got	+ $1.50	− $1.00	− $4.25	− $3.25	=	−$7.00
Charlie thinks Charlie effectively got	− $0.50	− $1.00	+ $12.75	− $6.25	=	+$5.00
Charlie thinks Devin effectively got	− $0.50	+ $3.00	− $4.25	− $2.25	=	−$4.00
Devin thinks Alex effectively got	− $1.50	− $4.00	− $3.25	+$11.75	=	+$3.00
Devin thinks Blair effectively got	+ $4.50	− $4.00	− $3.25	− $3.25	=	−$6.00
Devin thinks Charlie effectively got	− $1.50	− $4.00	+ $9.75	− $6.25	=	−$2.00
Devin thinks Devin effectively got	− $1.50	+$12.00	− $3.25	− $2.25	=	+$5.00

	Full			Own			Else		
	dinner	t-shirt	charger	dinner	t-shirt	charger	dinner	t-shirt	charger
Alex	$14.00	$4.00	$9.00	$3.50	$1.00	$2.25	$10.50	$3.00	$6.75
Blair	$18.00	$16.00	$5.00	$4.50	$4.00	$1.25	$13.50	$12.00	$3.75
Charlie	$2.00	$8.00	$17.00	$0.50	$2.00	$4.25	$1.50	$6.00	$12.75
Devin	$6.00	$12.00	$13.00	$1.50	$3.00	$3.25	$4.50	$9.00	$9.75
Average	$10.00	$10.00	$11.00						

	dinner	t-shirt	charger	cash		net
Alex thinks Alex effectively got	− $3.50	− $1.00	− $2.25	+$11.75	=	+ $5.00
Alex thinks Blair effectively got	+$10.50	+ $3.00	− $2.25	−$19.25	=	− $8.00
Alex thinks Charlie effectively got	− $3.50	− $1.00	+ $6.75	− $5.25	=	− $3.00
Alex thinks Devin effectively got	− $3.50	− $1.00	− $2.25	+$12.75	=	+ $6.00
Blair thinks Alex effectively got	− $4.50	− $4.00	− $1.25	+$11.75	=	+ $2.00
Blair thinks Blair effectively got	+$13.50	+$12.00	− $1.25	−$19.25	=	+ $5.00
Blair thinks Charlie effectively got	− $4.50	− $4.00	+ $3.75	− $5.25	=	−$10.00
Blair thinks Devin effectively got	− $4.50	− $4.00	− $1.25	+$12.75	=	+ $3.00
Charlie thinks Alex effectively got	− $0.50	− $2.00	− $4.25	+$11.75	=	+ $5.00
Charlie thinks Blair effectively got	+ $1.50	+ $6.00	− $4.25	−$19.25	=	−$16.00
Charlie thinks Charlie effectively got	− $0.50	− $2.00	+ $12.75	− $5.25	=	+ $5.00
Charlie thinks Devin effectively got	− $0.50	− $2.00	− $4.25	+$12.75	=	+ $6.00
Devin thinks Alex effectively got	− $1.50	− $3.00	− $3.25	+$11.75	=	+ $4.00
Devin thinks Blair effectively got	+ $4.50	+ $9.00	− $3.25	−$19.25	=	− $9.00
Devin thinks Charlie effectively got	− $1.50	− $3.00	+ $9.75	− $5.25	=	+ $0.00
Devin thinks Devin effectively got	− $1.50	− $3.00	− $3.25	+$12.75	=	+ $5.00