

Blair, Casey, and Devin are cleaning up after the party. The band left them an autographed shirt along with some miscellaneous merch. Blair, Casey, and Devin were able to split up the miscellaneous merch with no issues, but when they got to the shirt they had an issue: one shirt, three people. They agreed (a) they were each owed a third of the shirt, (b) cutting the shirt in thirds was foolish, and (c) they'd rather one person get the shirt and the other two get money.

Who should get the shirt and how much do they need to pay the other two?

Blair loved the band and wants the t-shirt forever, which in today's fast paced world means \$30. Casey was so-so about the band but thinks POPS would buy the shirt for about \$18. Devin noticed a guy from school acting all jelly and figures he would buy it for \$24.

	T-Shirt	33% of T-Shirt
Blair	\$30	\$10
Casey	\$18	\$6
Devin	\$27	\$9

- What is wrong with the following solutions?
- How much did each person start out with? (in dollars, but measure the shirt and the money)
- How much did each person end up with? (in dollars, but measure the shirt and the money)
- How much profit for each person? (in dollars, but measure the shirt and the money)

(a) Blair gets the shirt and pays Casey \$18 and Devin \$27

Casey and Devin are very happy, but

Blair just paid \$45 for $\frac{2}{3}$ of a \$30 shirt, \$25 too much!

	Before	After	Profit
B	10	30-18-27	-15-10 = -25
C	6	18	18-6 = 12
D	9	27	27-9 = 18

(b) Blair gets the shirt and pays Casey \$5 and Devin \$5

Blair is very happy.

Casey ~~was~~ lost \$6 of shirt, but was only repaid \$5, \$1 too little!

	Before	After	Profit
B	10	30-5-5	20-10 = 10
C	6	5	-1
D	9	5	-4

(c) Casey gets the shirt and pays Blair \$6 and Devin \$6

Everything! Casey thinks it is (exactly) fair, but both Blair and Devin lost money!

	Before	After	Profit
B	10	6	-4
C	6	18-6-6	0
D	9	6	-3

(d) Casey gets the shirt and pays Blair \$10 and Devin \$9

Now Casey makes Blair and Devin happy,

but paid \$19 for $\frac{2}{3}$ of an \$18 shirt, \$7 too much!

	Before	After	Profit
B	10	10	0
C	6	18-10-9	-7
D	9	9	0

(e) Devin gets the shirt and pays Blair \$10 and Casey \$6

Blair and Casey are OK with the price, and Devin gets (all) of the extra money. :)?

	Before	After	Profit
B	10	10	\$0
C	6	6	\$0
D	9	27-10-6	\$2

(f) Devin gets the shirt and pays Blair \$11 and Casey \$7

Now Blair and Casey get the extra money.

	Before	After	Profit
B	10	11	\$1
C	6	7	\$1
D	9	27-11-7	\$0

Can you suggest an even better split?

Yes! But do this as homework.