



CCSS: 7.RP.A.2: Recognize and represent proportional relationships between quantities. 7.RP.A.3: Use proportional relationships to solve ... percent problems. Examples: ... tax, gratuities and commissions ...

Launch

SAMPLE SOLUTIONS ARE SHOWN BELOW.



A movie studio sets two offers in front of a movie star to act in a blockbuster upcoming action flick. The star can choose only one offer.

Make a case for accepting each offer. Then explain which offer you would choose.



Offer A: \$3 million is a lot of money. If you accept this offer, you could get a lot of money without worrying about ticket sales. Offer B: 3% of ticket sales could be a lot of money if the movie makes a lot of money. 3% is 3 out of a 100. So, you would get 3 million dollars for every 100 million dollars the movie makes. What I Would Choose: I would choose the \$3 million one-time payment so that I make a lot of money no matter what happens with ticket sales.

Reflect Which offer has a constant of proportionality? Explain.

Sample: Offer B has a constant of proportionality. No matter how many tickets are sold, the movie star will get 3% of the total sales. With Offer A the movie star gets a one-time payment that doesn't change based on ticket sales.

Got It?

PART 1 Got It

Tips are calculated similarly to taxes. Suppose the team brought a total of \$175 to pay for dinner. Do they have enough money to tip the waiter 18% of the subtotal? Explain.

<i>The Diner</i>	
Hamburger (4)	\$34.58
Spaghetti (5)	\$40.09
Fries (4)	\$17.00
Caesar Salad (2)	\$16.57
Milkshake (11)	\$33.76
Subtotal	\$142.00
Meals Tax (5%)	\$7.10
TOTAL	\$149.10
Thank You! Please Come Again	
	00310

Yes, the team has enough money because the total including meals tax and an 18% tip will be \$174.66, which is less than \$175.

Got It?

PART 2 Got It (1 of 2)

At a real estate agency, a real estate agent sold a house for \$345,000. Her commission rate is 3%.

- a. How much did the real estate agent earn on the house?
- b. How much did the seller make on the house?

\$10,350 and \$334,650

PART 2 Got It (2 of 2)

Suppose you are a car salesperson. Would you prefer to make a 6% commission on each car you sell, or would you prefer to get a flat fee of \$1,500 per car? Explain.

It would depend on the costs of the cars that you sell. If you sell a car that is \$33,000, a commission is better because:

$$\begin{aligned}\text{commission} &= \text{commission rate} \cdot \text{selling price} \\ &= 0.06 \cdot 33,000 \\ &= \$1,980\end{aligned}$$

So, 6% commission, in this case \$1,980, would give you more than the flat fee of \$1,500.

If instead you sell a car that is \$16,800, a flat fee is better because:

$$\begin{aligned}\text{commission} &= \text{commission rate} \cdot \text{selling price} \\ &= 0.06 \cdot 16,800 \\ &= \$1,008\end{aligned}$$

So, the flat fee of \$1,500 is greater than the 6% commission, in this case \$1,008.

Got It?

PART 3 Got It (1 of 2)

Jon has a new job at an electronics store. He has two options for how to be paid.

He plans to work 7 hours a day, 5 days a week. He also estimates that he can sell about \$3,500 worth of electronics per week. Which option would give Jon more earnings per week? Explain.

Option A

Hourly wage of \$16.00

Option B

16% commission on total sales

Both options generate the same amount of earnings.

PART 3 Got It (2 of 2)

If you were Jon, which option would you choose if they both generate the same weekly pay based on his estimated work hours and sales predictions?

Option A

Hourly wage of \$16.00

Option B

16% commission on total sales

He should choose Option A.

Close and Check



Focus Question

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In what situations are fixed numbers better than percents of an amount? In what situations are percents better than fixed numbers?

Sample: Fixed numbers do not change, while the percent of an amount depends on the amount. Percents are good when you can take risks with what the resulting quantity is. Fixed numbers are good if you want to have a reliable quantity every time.



Do you know HOW?

1. You pay \$3.50 per gallon including taxes for 15 gallons of gas. Federal and state gas taxes make up 14% of the total cost. How much do you pay in gas taxes?

\$7.35

2. A new car depreciates (loses value) by 9% immediately after it is purchased and driven from the lot. If a new car costs \$28,400, how much is it worth right after it is driven off the car lot?

\$25,844

3. A company expects a new sales employee to work 40 hours per week. The company offers the employee either \$25 per hour or a salary of \$500 per week plus a 7% sales commission. Each sales employee averages \$7,800 in sales each week. Which offer pays more?

salary plus commission



Do you UNDERSTAND?

SAMPLE SOLUTIONS ARE SHOWN BELOW.

4. **Error Analysis** A basketball player made 88% of 125 free throw attempts. Your friend calculates how many free throws the player made below. Explain her error and find the correct number.

$$\begin{aligned}\text{total} &= 88\% \cdot 125 \\ &= 88.0 \cdot 125 \\ &= 11,000\end{aligned}$$

She did not convert the percent to a decimal correctly. $88\% = 0.88$, so the player made 110 free throws.

5. **Writing** Your uncle offers to sell your guitar at his auction. He offers you \$75 or 50% of the final selling price. How would you choose? Explain.

\$75 is 50% of \$150. I would choose based on whether I thought the guitar would sell for more or less than \$150.