

DO NOW TUESDAY, DECEMBER 10, 2013



WHICH SHOP HAS THE LOWEST PRICE PER ROSE?



OFFERS A DOZEN (12) ROSES FOR \$36.00



OFFERS THREE ROSES FOR \$12.00

We will solve¹ percent problems using proportions.

Name: _____

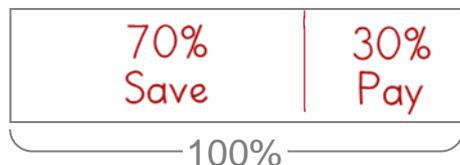
12.10.13 Assignment

7.RP.3 Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*

Activate Prior Knowledge

Draw a diagram to answer the following questions.

1. If you save 70% off something you bought, what percent shows the amount you pay?



2. If you save 15% off something you bought, what percent shows the amount you pay?



CFU

What are we going to learn?

 What does *solve* mean?
Solve means _____.

Make Connection

Students, you are familiar with calculating percent. Now, we will solve percent problems using proportions.

Vocabulary

¹ find the answer

Concept Development

A **percent increase** is when there is an **increase** in the original quantity.
 A **percent decrease** is when there is a **decrease** in the original quantity.
 A **proportion** is an equation that states **two ratios are equivalent**.
 • *The cross multiplication of a proportion is equal.*

Percent Increase	Percent Decrease
Tax Tip Markup	Sale Discount Coupon

Solving Percent Problems

Hannah's Clothing is having a **70% off sale** on denim jeans that **originally cost \$40**.
 What is the sale price of the jeans?



Percent Decrease Example

70% Save	30% Pay
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$$\begin{array}{r}
 \text{Percent} \qquad \text{Quantity} \\
 \frac{30}{100} = \frac{x}{40} \\
 \frac{3}{10} = \frac{x}{40} \\
 3 \cdot 40 = 10 \cdot x \\
 \frac{120}{10} = \frac{10x}{10} \\
 12 = x
 \end{array}$$

CFU

Joanna bought a clock for \$15. If she has to pay 7% for tax, what is the total cost of the clock?

Explain why the problem above is an example of a percent increase.

What is the difference between percent increase and percent decrease?

The difference between percent increase and percent decrease is _____.

Vocabulary

² equal value

A **proportion** is an equation that states **two ratios** are **equivalent**.

- The cross multiplication of a proportion is equal.

Solving Percent Problems

(Setting up a proportion)

Hannah's Clothing is having a **70% off sale** on denim jeans that **originally cost \$40**.

What is the **sale price** of the jeans?



<u>Percent</u>	<u>Quantity</u>
$\frac{30}{100}$	$\frac{x}{40}$
=	

<u>Percent</u>	<u>Quantity</u>
$\frac{\%}{100}$	$\frac{\text{part}}{\text{whole}}$
=	



Percent Decrease Example

Percent Increase	Percent Decrease
Tax Tip Markup	Sale Discount Coupon

CFU

In your own words, what is a proportion?
 A proportion is _____.

A **proportion** is an equation that states **two ratios** are **equivalent**.

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CFU

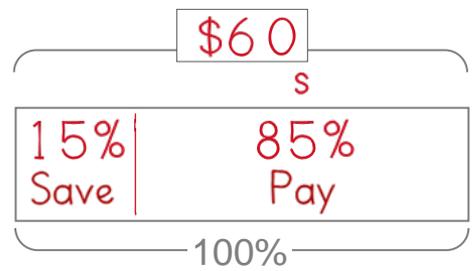
3 How did I/you set up the proportion?

4 How did I/you solve for the unknown quantity?

Solve percent problems using proportions.

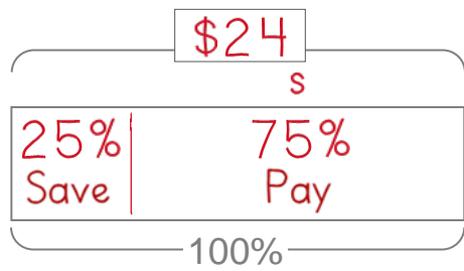
- Determine what the question is asking. (underline)
- Determine corresponding₃ percent and quantity. Hint: Draw a diagram.
- Set up a proportion for the percent and quantity. Hint: Reduce when possible.
- Cross multiply, then solve for the unknown quantity.
- Interpret₄ your solution. Hint: Answer the question.

1. The Blaze music player is on sale for 15% off. What is the sale price if the original price was \$60?



$$\frac{85}{100} = \frac{p}{60}$$

2. A basket of roses is discounted 25%. What is the discounted price if the original price was \$24?



$$\frac{75}{100} = \frac{p}{24}$$

Percent **Quantity**

$$\frac{\%}{100} = \frac{\text{part}}{\text{whole}}$$

Vocabulary

³ matching

⁴ explain

A **proportion** is an equation that states **two ratios** are **equivalent**.

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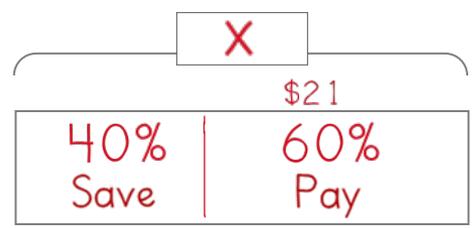
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CFU

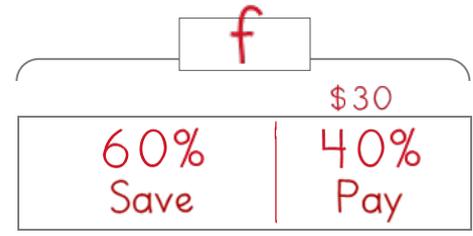
- How did I/you set up the proportion?
- How did I/you solve for the unknown quantity?

3. Tao has a 40% off coupon for an oil change service. If he paid \$21 with the coupon, what is the original price of the oil change?



$$\frac{60}{100} = \frac{21}{X}$$

4. To bring in more customers, MP Fitness is offering 60% off their startup fee for their gym membership. If Larry paid a startup fee of \$30, what is the original price of the startup fee?



$$\frac{40}{100} = \frac{30}{f}$$

Percent	Quantity
%	part
100	whole

Percent	Quantity
$\frac{\%}{100}$	$= \frac{\text{part}}{\text{whole}}$

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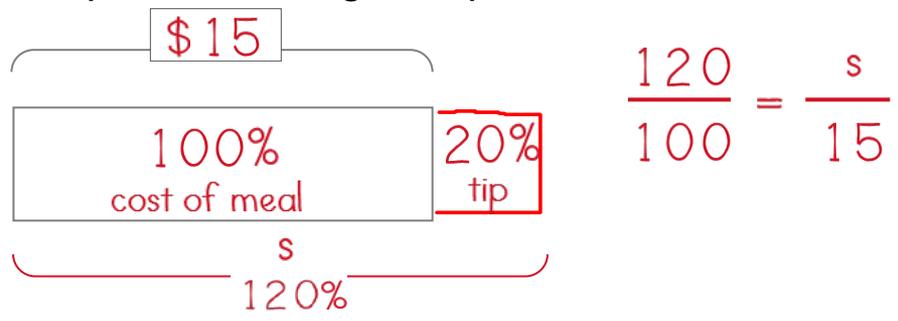
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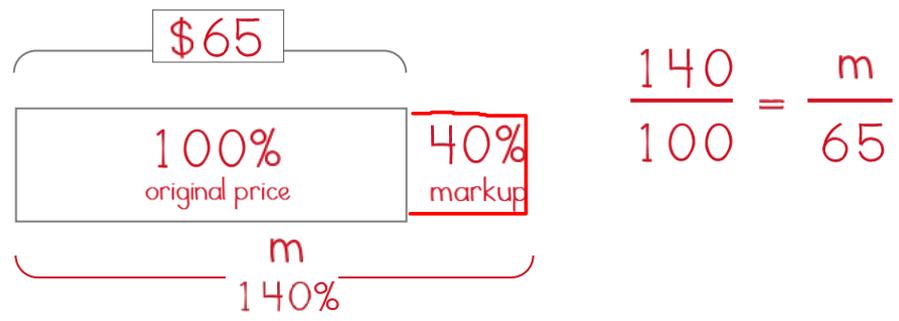
CFU

- How did I/you set up the proportion?
- How did I/you solve for the unknown quantity?

5. Trish went out to dinner. Her meal was \$15 and she left a 20% tip. How much did she spend including the tip?



6. Due to high demand, Tim's Electronics will raise the price of their cell phone by 40%. If the original price of the cell phone was \$65, what is the markup price?



Solving Math Problems

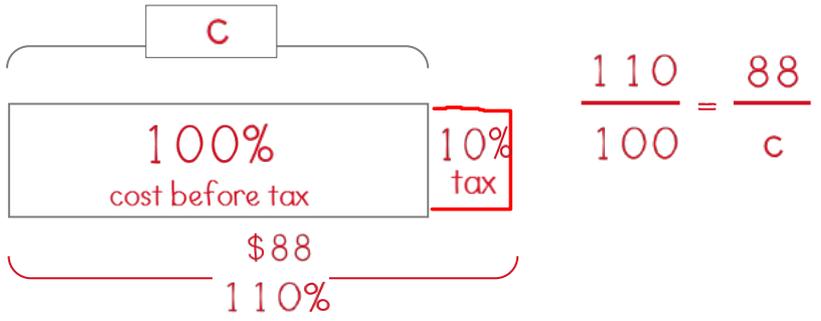
- 1 Determine what the question is asking.
- 2 Determine the math concept required.
- 3 Determine relevant information.
- 4 Solve the problem, then interpret the answer.
- 5 Check the reasonableness of your answer.

CFU

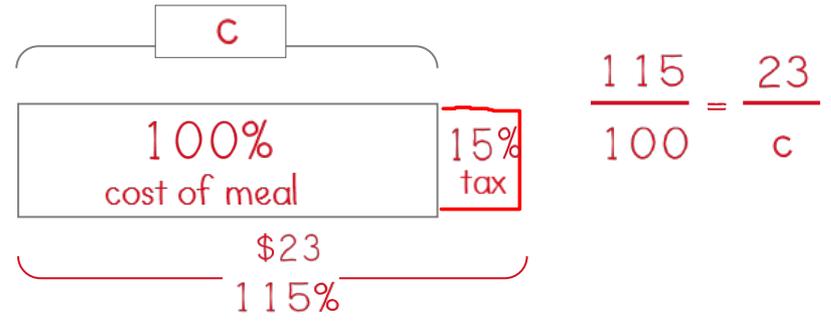
- 1 How did I/you determine what the question is asking?
- 2 How did I/you determine the math concept required?
- 3 How did I/you determine the relevant information?
- 4 How did I/you solve and interpret the problem?
- 5 How did I/you check the reasonableness of the answer?

Percent	Quantity
$\frac{\%}{100}$	$= \frac{\text{part}}{\text{whole}}$

7. Matt bought a bike from the store. With tax of 10%, he paid a total of \$88. What was the cost of the bike before tax?



8. Including a tip of 15%, Tomas and Fred paid \$23 for their meal at May's Cafe. What was the cost of the meal before their tip?

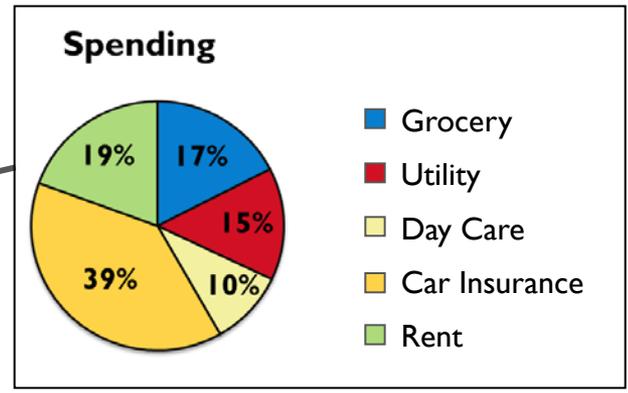


A **proportion** is an equation that states **two ratios** are **equivalent**.

- The cross multiplication of a proportion is equal.

1 Solving percent problems with proportions will help you manage your personal finances.

I'm spending too much on car insurance. It's time to look for a better price.



2 Solving percent problems with proportions will help you do well on tests.

(TIP AMOUNT)

$$\begin{array}{r}
 \$90.00 \\
 \times 0.20 \\
 \hline
 \end{array}$$

Sample Test Question:

15. George went to get his car detailed. His bill was \$90. How much did he spend if he included a tip of 20%?

Determine whether the statement is true or false for the problem above. Select Yes or No for A-D.

A The amount of his tip is \$18.	<input type="radio"/> Yes	<input type="radio"/> No
B He spent \$110 including his tip.	<input type="radio"/> Yes	<input type="radio"/> No
C The amount of his tip is \$20	<input type="radio"/> Yes	<input type="radio"/> No
D He spent \$108 including his tip.	<input type="radio"/> Yes	<input type="radio"/> No

CFU

Does anyone else have another reason why it is relevant to solve percent problems using proportions? (Pair-Share) Why is it relevant to solve percent problems using proportions? You may give one of my reasons or one of your own. Which reason is more relevant to you? Why?

Vocabulary

⁵ take care of

A **proportion** is an equation that states **two ratios** are **equivalent**.

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Skill Closure

- Solve percent problems using proportions.**
- 1 Determine what the question is asking. (underline)
 - 2 Determine corresponding percent and quantity. Hint: Draw a diagram.
 - 3 Set up a proportion for the percent and quantity. Hint: Reduce when possible.
 - 4 Cross multiply, then solve for the unknown quantity.
 - 5 Interpret your solution. Hint: Answer the question.

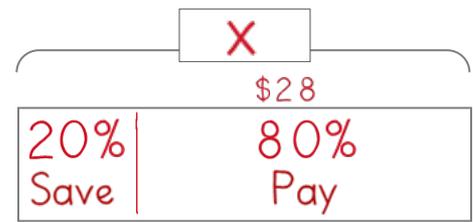
<u>Percent</u>		<u>Quantity</u>
%	=	part
100		whole

1. A bag of soil is on sale for 15% off. What is the sale price if the original price is \$20?



$$\frac{85}{100} = \frac{s}{20}$$

2. Juan has a 20% off coupon for dry cleaning. If he paid \$28 with the coupon, what would the price be without the coupon?



$$\frac{80}{100} = \frac{28}{x}$$

A **proportion** is an equation that states **two ratios** are **equivalent**.

- *The cross multiplication of a proportion is equal.*

$$\frac{\text{Percent}}{100} = \frac{\text{Quantity}}{\text{part over whole}}$$

Access Common Core

Perry’s mom bought a new laptop on sale for **10% off**. If the **original price** of the laptop is **\$1,000.00**, what is the sale price of the laptop?

Without working out the problem above, which of the following is a possible sale price of the laptop? Explain your answer.

- A \$900.00
- B \$1,100.00

Summary Closure

What did you learn today about solving percent problems using proportions?
(Pair-Share) Use words from the word bank.

Word Bank

ratio
equivalent
cross multiply
increase
decrease

Independent Practice

A **proportion** is an equation that states **two ratios** are **equivalent**.

- The cross multiplication of a proportion is equal.

Solve percent problems using proportions.

- 1 Determine what the question is asking. (underline)
- 2 Determine corresponding percent and quantity. Hint: Draw a diagram.
- 3 Set up a proportion for the percent and quantity. Hint: Reduce when possible.
- 4 Cross multiply, then solve for the unknown quantity.
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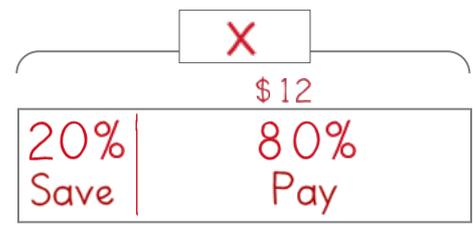
Percent	Quantity
$\frac{\%}{100}$	$= \frac{\text{part}}{\text{whole}}$

1. The Blizzard music player is on sale for 30% off. What is the sale price if the original price was \$80?



$$\frac{70}{100} = \frac{s}{80}$$

2. To get customers to try their fat-free salad dressing, Tom's Deli marked down their fat-free salad dressing 20%. What was the original price if the markdown price is \$12?



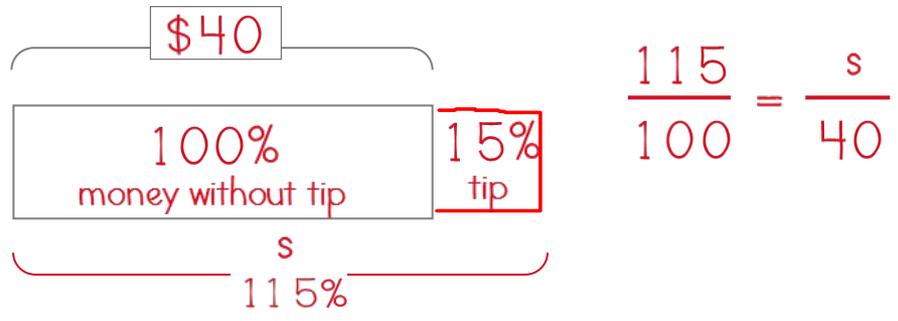
$$\frac{80}{100} = \frac{12}{x}$$

Solving Math Problems

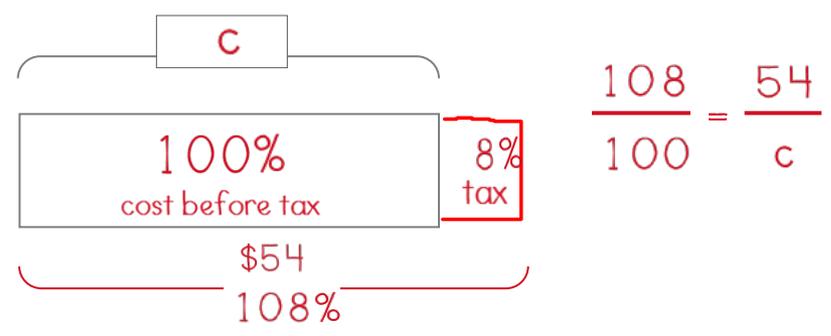
- 1 Determine what the question is asking.
- 2 Determine the math concept required.
- 3 Determine relevant information.
- 4 Solve the problem, then interpret the answer.
- 5 Check the reasonableness of your answer.

Percent	Quantity
$\frac{\%}{100}$	$= \frac{\text{part}}{\text{whole}}$

3. Esmeralda cut her neighbor's lawn on Saturday. She received \$40 and a 15% tip. How much did she receive including her tip?



4. Jerry bought a cell phone from the store. With tax of 8%, he paid a total of \$54. What was the cost of the cell phone before tax?



Solve percent problems using proportions.

- 1. Jose’s Sporting Outlet is having a 40% off sale on all of their winter clothing. If a pair of snow boots originally cost \$70, what is the sale price?
- 2. Due to high demand, Tim’s Electronics will raise the price of their headphones by 30%. If the original price of the headphones was \$20, what is the markup price?

Access Common Core

A store ad shows that CLEARANCE items are already 60-80% off their original price. It then says TAKE AN EXTRA 40% off ! Assuming a \$100 item is already 80% off, is it possible to take another 40% off? Explain your thinking.

TAKE AN **EXTRA 40%** off
IN STORE & ONLINE NOW THROUGH MONDAY
***Offer excludes Jewelry. No Promo Codes Required.

BIGGEST
GOLD STAR
CLEARANCE
ALREADY **60-80%** off

shop now

regular price
\$100.00

OUR PRICE
80% off
\$ 20.00

Solve percent problems using proportions.

- 1. Chin bought a video game from the store. With tax of 10%, he paid a total of \$44. What is the cost of the video game before tax?
- 2. To attract new customers, Luke's Hair Salon is offering 20% off a haircut for new customers. What is the discounted price of a haircut that is normally \$25?

Access Common Core

Roberto ate breakfast at Marissa's Café. Below is his receipt. Answer the following questions.

Marissa's Café	
231 E. Lite St • Town, CA 92847	
Table 18	
2 x Coffee	\$3.00
2 x Fruit Salad	\$7.00
1 x Combination #4	\$5.00
TOTAL	\$15.00

- 1. How much will his bill be if he has a 20% off coupon?
- 2. How much will he spend altogether if he gave the waiter a 20% tip?
- 3. How much will he spend if he was charged 10% tax on his total?

Solve percent problems using proportions.

- 1. Marcy has a 40% off coupon for dry cleaning. If she paid \$30 with the coupon, what would the price be without the coupon?
- 2. Terry and Javier went to eat at a restaurant. Their bill was \$50. How much did they spend if they added a tip of 15%?

Access Common Core

The Handyman Drill is on sale for 25% off. What is the sale price if the original price was \$48?

- 1. Determine whether the statement is true or false for the problem above. Select Yes or No for A-D.
 - A** The sale price is \$60. Yes No
 - B** The sale price is \$36. Yes No
 - C** The amount saved is \$12. Yes No
 - D** The amount saved is \$36. Yes No

George went to get his car detailed. His bill was \$90. How much did he spend if he included an additional tip of 20%?

- 2. Determine whether the statement is true or false for the problem above. Select Yes or No for A-D.
 - A** The amount of his tip is \$18. Yes No
 - B** He spent \$110 including his tip. Yes No
 - C** The amount of his tip is \$20 Yes No
 - D** He spent \$108 including his tip. Yes No