

Name: _____

Date: _____

PERCENT REVIEW
COMMON CORE ALGEBRA I



One of the major topics that you studied in 7th Grade Common Core Math was the concept of a **percent**. Quite possibly, percents are the most applied and misunderstood concepts in mathematics. In today's lesson, we will review the major ideas and problems dealing with percents. The main idea of percents is as follows.

A **percent** always **compares two quantities** as a **proportional relationship** out of **100**.

Exercise #1: Jonathan is getting a raise from \$12.50 per hour to \$14.75 per hour. His supervisor, Makayla, got a raise from \$22.00 per hour to \$25.30 per hour.

- (a) How much in terms of dollars per hour is Jonathan's salary going up? (b) By what percent is Jonathan's salary increasing?

- (c) Who received the larger increase in salary in terms of dollars per hour? (d) Who received the larger percent increase in salary?

You can pretty much always solve percent problems by setting up proportional equations that involve 100.

Exercise #2: Gabe is buying a pair of jeans at a local store that are priced at \$45. He knows that the county he lives in has an 8% sales tax added onto the list price. If Gabe has a gift card for \$50, will it cover the cost of the jeans and the tax? Show work to justify your answer.

Exercise #3: The population of deer in a forest preserve is predicted to decline by 5% this year. If the current population is 560, what population is predicted for next year? What percent of the deer will remain?



Although it is convenient to solve percent problems using ratios, **it is critical** that you learn a **different method**. Some of you may have seen this before, if you've had teachers show it to you. If not, please make sure to understand what follows.

Exercise #4: Consider the following problem. Let's say that I want to leave a 15% tip on a meal that cost \$35.

- (a) Find the tip by setting up a ratio involving 100. (b) Find the tip by doing a single multiplication problem. Why is this the same as (a)?

Know this important method for finding percents of totals:

FINDING PERCENTS BY MULTIPLYING

To find $p\%$ of a total, T , simply find the product: $\frac{p}{100} \cdot T$. Often $\frac{p}{100}$ is expressed as a decimal.

This “quick” way of finding percents of totals is a skill that you **must** become **fluent** with. Let's get some practice with it in the next exercise.

Exercise #5: Find each of the following. Write down the product that you use to find your answer.

- (a) 20% of 85 (b) 12% of 200 (c) 6% of 550
- (d) 4.5% of 120 (e) 36% of 96 (f) $2\frac{1}{4}\%$ of 350

Exercise #6: Which of the following calculations would find 8.5% of 250?

- (1) $(85)(250)$ (3) $(0.85)(250)$
- (2) $(8.5)(250)$ (4) $(0.085)(250)$



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PERCENT REVIEW
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FLUENCY

1. Evaluate the following percent problems by setting up and solving a ratio like we did in Exercises #1 through #3 in the lesson.

(a) Find 7% of 280

(b) Find 12% of 300

(b) Find 2% of \$1250

2. Find each of the following by a single multiplication problem (like what we did in Exercise #5 from the lesson). Write down the product that you use in your calculation.

(a) Find 6% of 350

(b) Find 25% 80

(c) Find 15% of \$35.00

3. Find each of the following by a single multiplication problem (like what we did in Exercise #5 from the lesson). These are trickier than #2. If needed, take the percent and divide it by 100 on your calculator to determine what to multiply by. Write down the product that you use in your calculation. Do not round your final answers.

(a) 3.2% of 360

(b) 2.7% of 90

(c) 12.8% of 240

(d) 0.8% of 450

(e) 0.5% of 500

(f) 0.25% of 320

4. If x represents 2.8% of 270, then which of the following equation would not result in the correct value for x ?

(1) $\frac{x}{270} = \frac{2.8}{100}$

(3) $x = (0.028)(270)$

(2) $x = \frac{2.8}{100} \cdot 270$

(4) $x = (0.28)(270)$



APPLICATIONS

5. Prestel currently makes \$8.50 per hour. His boss has promised him a 15% raise in his hourly earnings.
- (a) Calculate 15% of \$8.50. Why can't Prestel get exactly a 15% raise? What would his boss actually give him?
- (b) After the raise, what is Prestel's new salary? Show the calculation that leads to your answer.
6. Imani's rent increased from \$560 per month to \$600 per month. Her friend, Ariana, had her rent increase from \$825 to 875. Who had the larger percent increase in their rent? Remember to set up your ratios using the **original rent**. See Exercise #1 from the lesson if you want to see a similar problem.
7. The United States population is roughly 314 million people (314,000,000). The workforce participation rate, defined as the percent of the population working or looking for work, is 62.8%. The unemployment rate is the percent of the workforce that is looking for work, but cannot find it.
- (a) How many people are working or looking for work in the United States?
- (b) If the unemployment rate is currently 6.8%, then how many people are unemployed to the nearest hundred thousand.

REASONING

8. Niko had his savings increase by 5% this year. He started with \$350 in his account and calculated how much he had at the end of the year by using the following sets of calculations:

$$\$350 \times 0.05 = \$17.50 \quad \$350 + \$17.50 = \$367.50$$

Find a single number that Niko could have multiplied his starting amount of \$350 by to get \$367.50 by solving the equation below for r . Why does this number make sense?

$$350r = 367.50$$

