

Name: \_\_\_\_\_

## Sec. 3.7: Solve Percent Problems

Percent: There are 100 cents in a dollar, and 100 years in a century, so 'percent' means 'per hundred.'

$$\text{Example: } 57\% = \frac{57}{100}$$

We can use this idea to help solve percent problems. Writing a percent as a ratio, we can set up a proportion and solve for the unknown.

Hint: Look for key words, such as 'percent,' 'is,' and 'of.' We can generally arrange those key words like this:

$$\frac{\text{percent}}{100} = \frac{\text{is}}{\text{of}}$$

Another way to look at this is that  $\frac{\text{percent}}{100}$  and  $\frac{\text{is}}{\text{of}}$  both represent the ratio  $\frac{\text{part}}{\text{whole}}$ . Note that some people speak of the ratio  $\frac{\text{part}}{\text{whole}}$  as  $\frac{\text{part of the base}}{\text{base}}$ .

Example: What percent of 50 is 20?

$$\frac{x}{100} = \frac{20}{50} \rightarrow 50x = 2000 \rightarrow x = 40, \text{ which means that 20 is 40\% of 50.}$$

In another popular, traditional approach, the word 'is' often means 'equals,' and the word 'of' often tells us to multiply. Using this approach in the above example:

$$\text{What percent of 50 is 20?} \rightarrow x(50) = 20 \text{ or } 50x = 20 \rightarrow x = \frac{20}{50} = \frac{2}{5} \rightarrow x = 0.40 = 40\%$$

Similar to above is the *percent equation*:  $a = p\% \cdot b$  (*a is p percent of b*)

### Examples

1. Identify the percent, the base, and the part of the base in the following statement: 36 is 30% of 120.

Use a proportion to answer the question.

2. What percent of 80 is 16?
3. What percent of 40 is 60?
4. What number is 14% of 120?
5. 48 is what percent of 128?

Use the percent equation to answer the question.

6. What percent of 115 is 37?
7. What number is 62% of 194?
8. A high school had an enrollment of 1,254 students one year and 1,287 students the following year. Find the percent change in the enrollment.

Sec. 3.7 Practice Problems

Use a proportion to answer the question. Round to one decimal place, if necessary.

1) 59% of what is 115?

2) What percent of 110.8 is 16?

3) What percent of 67 is 20?

4) 2 is what percent of 48?

5) 97 is what percent of 109?

6) 95% of 26.5 is what?

7) What is 9% of 114?

8) 30% of what is 85?

9) What is 390% of 108?

10) 95% of 61 is what?

Use the percent equation to answer the question. Round to one decimal place, if necessary.

11) 230% of what is 32?

12) 126.9 is 23% of what?

13) What percent of 147 is 129?

14) What is 52% of 25?

15) After completing 10 laps in the Daytona 500, a driver has completed 5% of the race. How many laps does the race have?

16) Find the percent tax if a consumer pays \$2.24 tax on an item priced at \$32.00.

17) A company had a profit of \$3.72 million in 2010 and \$3.28 million in 2011. Find the percent change in profit.

ANSWERS to Sec. 3.7 Practice Problems

1.) 194.9

2.) 14.4%

3.) 29.9%

4.) 4.2%

5.) 89%

6.) 25.2

7.) 10.3

8.) 283.3

9.) 421.2

10.) 58

11.) 13.9

12.) 551.7

13.) 87.8%

14.) 13

15.) 200 laps

16.) 7%

17.) 11.8% decrease (or - 11.8%)