Chapter 5 - Ratio, Proportion, and Percent
5.1 Ratio and Proportion
5.1 Exercise Set, page 331:1, 3, 7, 11, 19, 25, 31, 41, 43, 49, 51, 67

5.2 Introduction to Percent
5.2 Exercise Set, page 342:1, 3, 5, 9, 13, 31, 37, 45, 53

5.3 Percents and Fractions
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5.4 Solving Percent Problems Using Equations
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5.5 Solving Percent Problems Using Proportions
5.5 Exercise Set, page 365: 1, 5, 9, 15, 57, 65

5.1: 49

Objective D *For each proportion, find the unknown number n. See Examples 11 through 13.*

49. $\frac{n}{5} = \frac{6}{10}$

$\frac{n}{5} = \frac{3}{5}$

clearly, $n = 3$

$\left(\frac{n}{5}\right)(5) = \left(\frac{3}{5}\right)5$

$n = 3$

cross multiply

$5n = (3)(5)$

$\frac{5n}{5} = \frac{(3)(5)}{5}$

$n = 3$

$10n = (6)(5)$

$n = \frac{30}{10}$

$n = 3$

5.2

Write each percent as a decimal. See Examples 3 through 7.

29. A $\frac{1}{2}$-cup serving of dried tart cherries delivers 45% of an adult's Daily Value of vitamin A. (*Source:* USDA Nutrient Data Laboratory)

write 45% as a decimal

$45\% = 45(0.01)$

$= 0.45$

$45\% = 45\left(\frac{1}{100}\right) = \frac{45}{100} = 0.45$

5.3

Examples Write each fraction or mixed number as a percent.

6. $\frac{9}{20} = \frac{9}{20} \cdot 100\% = \frac{9}{20} \cdot \frac{100}{1}\% = \frac{900}{20}\% = 45\%$

7. $\frac{2}{3} = \frac{2}{3} \cdot 100\% = \frac{2}{3} \cdot \frac{100}{1}\% = \frac{200}{3}\% = 66\frac{2}{3}\%$

8. $1\frac{1}{2} = \frac{3}{2} \cdot 100\% = \frac{3}{2} \cdot \frac{100}{1}\% = \frac{300}{2}\% = 150\%$

Helpful Hint

$\frac{200}{3} = 66.\overline{6}.$

Thus, another way to write $\frac{200}{3}\%$ is $66.\overline{6}\%$.

$\frac{9}{20} = \left(\frac{9}{20}\right)\left(\frac{5}{5}\right) = \frac{45}{100} = 45\%$

$\frac{102}{51} = 2$

Work Practice 6–8

✓Concept Check Which digit in the percent 76.4582% represents

a. A tenth percent? 4 **b.** A thousandth percent? 8

c. A hundredth percent? 5 **d.** A whole percent? 6

tenth hundredth

7 6 . 4 5 8 2 %

hundredth thousandth

Memorize

If we let p represent a number, below we summarize using symbols.

Write a percent as a decimal:	Write a percent as a fraction:	Write a number as a percent:
$p\% = p(0.01)$	$p\% = p \cdot \frac{1}{100}$	$p = p \cdot 100\%$

5.3

Translate each to an equation. Then, solve it.

2. 36% of 72 is what number? Let x = the number

$(36\%)(72) = x$

$36\left(\frac{1}{100}\right)(72) = x$

$\frac{(36)(72)}{100} = x$

$\frac{(36)(36)}{50} = x$

$\frac{(36)(36)}{50} = x$

$\frac{(18)(2)(18)(2)}{(25)x} = x$

$\frac{(324)(2)}{25} = x$

$\frac{648}{25} = x$

$x = 25\frac{13}{25}$

$18^2 = 324$

$25\overline{)648}$

50

148

125

13

5.5

Percent Proportion

$$\frac{\text{amount}}{\text{base}} = \frac{\text{percent}}{100} \quad \leftarrow \text{always } 100$$

or

$$\begin{matrix}\text{amount} \rightarrow \\ \text{base} \rightarrow\end{matrix} \frac{a}{b} = \frac{p}{100} \quad \leftarrow \text{percent}$$

Example 7 Solving Percent Proportions for the Amount

What number is 30% of 9?

Solution: amount percent base

$$\frac{a}{9} = \frac{30}{100}$$

$\frac{a}{9} = \frac{30}{100}$

$a = (30\%)(9)$

$a = (30)\left(\frac{1}{100}\right)(9)$

$\frac{a}{9} = \frac{30}{100}$

Your Name MDE 10 bonus quiz 2 Write each problem.

1. Convert $\frac{3}{8}$ to a percent.

$\frac{3}{8} = .375$

$= .375(100\%)$

$= 37.5\%$

$8\overline{)3.000}$ = .375, remainders 24, 60, 56, 40

2. Convert 0.546 to a fraction. Then, reduce the fraction.

$\frac{546}{1000} = \frac{273}{500}$

$2\overline{)546}$ = 273, remainders 4, 14, 14, 6, 6, 0

3. 20 is what percent of 10?

$20 = x\%(10)$

$20 = x\left(\frac{1}{100}\right)(10)$

$20 = \frac{x}{10}$

$x = (20)(10)$

$x = 200$

Therefore, 20 is 200% of 10

Therefore, 20 is 200% of 10

2. Solve the proportion $\frac{5}{9} = \frac{n}{45}$.

$9n = (5)(45)$

$n = \frac{(5)(45)}{9} = \frac{(5)(9)(5)}{9}$

$n = 25$