Warm Up

1. $1 + bx + bx - 1 + x^2$
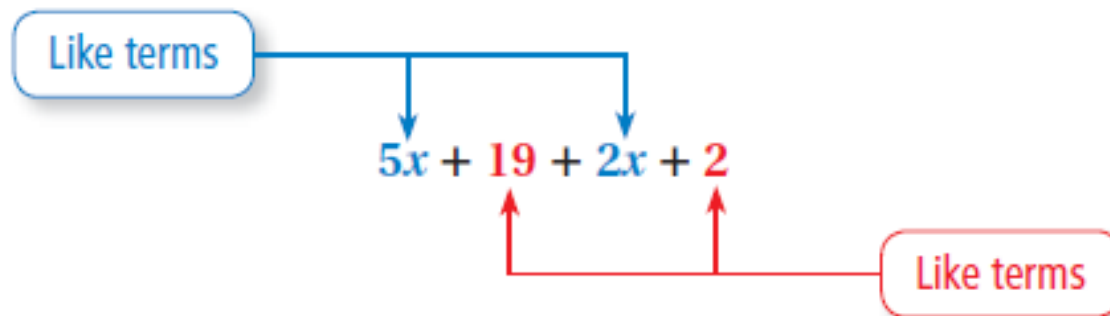
6. $-az + z - z^2 + 3z + z$

2. $-x + v^2 + v^2 - 1 - 1$

7. $y + c + 1 - y - y$

3. $-2 + u - uy - 1 + 3$

8. $6 + 6 + z - 4uz - 1$

In an algebraic expression, **like terms** are terms that have the same variables raised to the same exponents. Constant terms are also like terms.

Like terms

$$5x + 19 + 2x + 2$$

Like terms

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Warm Up Answers

1. $1 + bx + bx - 1 + x^2$
$= 2bx + x^2$

6. $-az + z - z^2 + 3z + z$
$= -az - z^2 + 5z$

2. $-x + v^2 + v^2 - 1 - 1$
$= 2v^2 - x - 2$

7. $y + c + 1 - y - y$
$= -y + c + 1$

3. $-2 + u - uy - 1 + 3$
$= -uy + u$

8. $6 + 6 + z - 4uz - 1$
$= -4uz + z + 11$

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Lesson 5.5　　　　　　　　　　　　　　　　　　　December 16, 2016

Essential Question:

How can you use mental math to find the percent of a number?

Lesson 5.5   December 16, 2016

Lesson Objective:

Students will be able to:

use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Self-Evaluation Scale

Score	Description
4	I can teach other students how to use multiplication to find the percent of a number and division to find the whole given the part and the percent.
3	I can use multiplication to find the percent of a number and division to find the whole given the part and the percent.
2	I recognize, but still need help to use multiplication to find the percent of a number and division to find the whole given the part and the percent.
1	I do not know how to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Activity 1 & 2

Work with a partner on Activity 1, 2, 3 & 4 on page 117 & 118 of your (soft cover) Record and Practice Journal.

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.
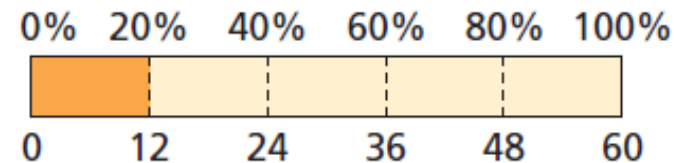
Key Idea

Finding the Percent of a Number

Words   Write the percent as a fraction. Then multiply by the whole. The percent times the whole equals the part.

Numbers   20% of 60 is 12.   **Model**

$$\frac{1}{5} \times 60 = 12$$

0% 20% 40% 60% 80% 100%

0   12   24   36   48   60

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

1 **Finding the Percent of a Number**

25% of 40 is what number?

$$25\% \text{ of } 40 = \frac{1}{4} \cdot 40 \qquad \text{Write the percent as a fraction and multiply.}$$

$$= \frac{1 \cdot \overset{10}{\cancel{40}}}{\underset{1}{\cancel{4}}} \qquad \text{Divide out the common factor.}$$

$$= 10 \qquad \text{Simplify.}$$

So, 25% of 40 is 10.

0%	25%	50%	75%	100%

0	10	20	30	40
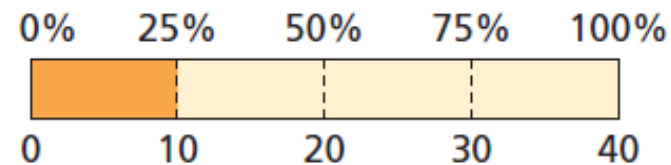
You can also use a ratio table to find the percent of a number.

2 Finding the Percent of a Number Using a Ratio Table

60% of 150 is what number?

Use a ratio table to find the part. Let one row be the *part,* and let the other be the *whole.* Find an equivalent ratio with 150 as the whole.

The first column represents the percent.

$$\frac{part}{whole} = \frac{60}{100} = 60\%$$

Part	60	30	90
Whole	100	50	150

÷ 2   × 3

÷ 2   × 3

∴ So, 60% of 150 is 90.

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

You can use a related division equation to find the whole given the part and the percent.

Key Idea

Finding the Whole

Write the percent as a fraction. Then divide the part by the fraction.

Words   The part divided by the percent equals the whole.

Numbers   20% of 60 is   12.

$$\frac{1}{5} \times 60 = 12 \longrightarrow 12 \div \frac{1}{5} = 60$$

Multiplication equation   Related division equation

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

3 **Finding the Whole**

75% of what number is 48?

$$48 \div 75\% = 48 \div \frac{3}{4}$$ Write the percent as a fraction and divide.
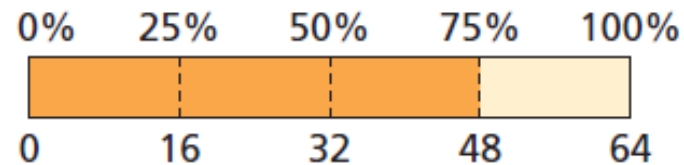
$$= 48 \cdot \frac{4}{3}$$ Multiply by the reciprocal.

$$= 64$$ Simplify.

So, 75% of 64 is 48.

0%	25%	50%	75%	100%

0	16	32	48	64

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

4 Finding the Whole Using a Ratio Table

120% of what number is 72?

Use a ratio table to find the whole. Find an equivalent ratio with 72 as the part.

The first column represents the percent.

$$\frac{\text{part}}{\text{whole}} = \frac{120}{100} = 120\%$$

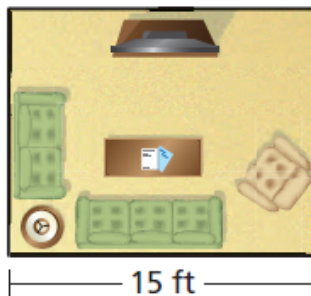|	÷20	×12
Part	120	6	72
Whole	100	5	60
	÷20	×12

So, 120% of 60 is 72.

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

5 **Real-Life Application**

The width of a rectangular room is 80% of its length. What is the area of the room?

Find 80% of 15 feet.

$$80\% \text{ of } 15 = \frac{4}{5} \times 15$$

$$= \frac{4 \times \overset{3}{\cancel{15}}}{\underset{1}{\cancel{5}}}$$

$$= 12$$

The width is 12 feet.

Use the formula for the area A of a rectangle.

$$A = 15 \times 12 = 180$$

So, the area of the room is 180 square feet.

15 ft

| 0% | 20% | 40% | 60% | 80% | 100% |

| 0 | 3 | 6 | 9 | 12 | 15 |

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.
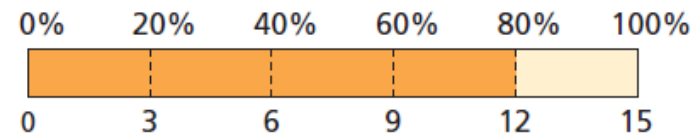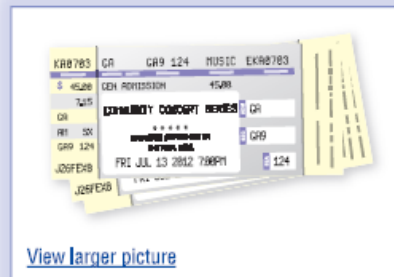
6 Real-Life Application

You win an online auction for concert tickets. Your winning bid is 60% of your maximum bid. How much more were you willing to pay for the tickets than you actually paid?

(A) $72   (B) $80   (C) $120   (D) $200

Your maximum bid is the *whole*, and your winning bid is the *part*. Find your maximum bid by dividing the part by the percent.

$$120 \div 60\% = 120 \div \frac{3}{5} \qquad \text{Divide the part by the percent.}$$

$$= 120 \cdot \frac{5}{3} \qquad \text{Multiply by the reciprocal.}$$

$$= 200 \qquad \text{Simplify.}$$

Your maximum bid is $200, and your winning bid is $120. So, you were willing to pay $200 - 120 = 80 more for the tickets.

∴ The correct answer is (B).

KR0783 GA   GA9 124   MUSIC EKR0783
$ 45.00 GEN ADMISSION   45.00
745
          CONDUROY CONCERT SERIES GA
GA
RM 5X
GA9 124   GA9
          FRI JUL 13 2012 730PM   124
J26FEX8
J26FEX8

View larger picture

Winning bid: US $120.00
Time remaining: 0 sec

15

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Assignment

Complete problems:

4, 8, 16, 20, 26, 28, 32, 34, 40, 50, & 52

on pages 229 - 231 in your Big Ideas Text Book.

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Assignment Answers

4. 4

8. 3

16. 8.36

20. 39.6

26. a. $3.15

b. $48.15

28. 90

32. 20

34. 20

40. 75 pounds

50. yes; To pass inspection, the ball must bounce back to between 68% and 75% of the starting height, or between 4.08 feet and 4.5 feet. It bounced back to 4.08$\overline{3}$ feet, so it passes.

Learning Objective: Students will be able to use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Lesson 5.5   December 9, 2014

Essential Question:

How can you use mental math to find the percent of a number?

Lesson 5.5   December 9, 2014

Lesson Objective:

Students will be able to:

use multiplication to find the percent of a number and division to find the whole given the part and the percent.

Self-Evaluation Scale

Score	Description
4	I can teach other students how to use multiplication to find the percent of a number and division to find the whole given the part and the percent.
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Learning Objective: Students will be able to make ratio tables and use them to solve problems.

Homework

In your Big Ideas Record and Practice Journal page 120.