January 23, 2015 Lesson 5.5 Period 3

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

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

$2bx + x^2$

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

$-x + 2v^2 - 2$

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

$u - uy$

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

$-9z + 5z - z^2$

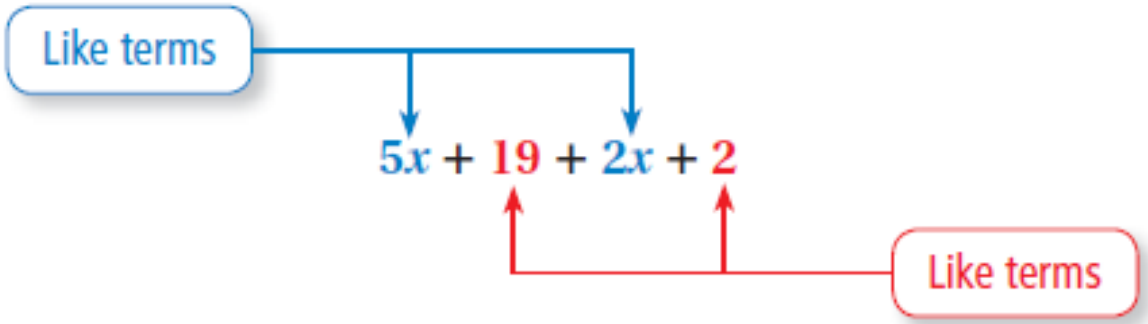
7. $y + c + 1 - y - y$

$-y + c + 1$

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

$11 + z - 4uz$

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



January 23, 2015 Lesson 5.5 Period 3

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

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

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

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

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

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

January 23, 2015 Lesson 5.5 Period 3

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 January 15, 2015

Essential Question:

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

Lesson 5.5

January 15, 2015

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.

January 23, 2015 Lesson 5.5 Period 3

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.

January 23, 2015 Lesson 5.5 Period 3

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

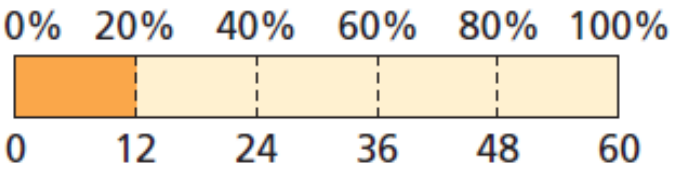
Finding the Percent of a Number

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

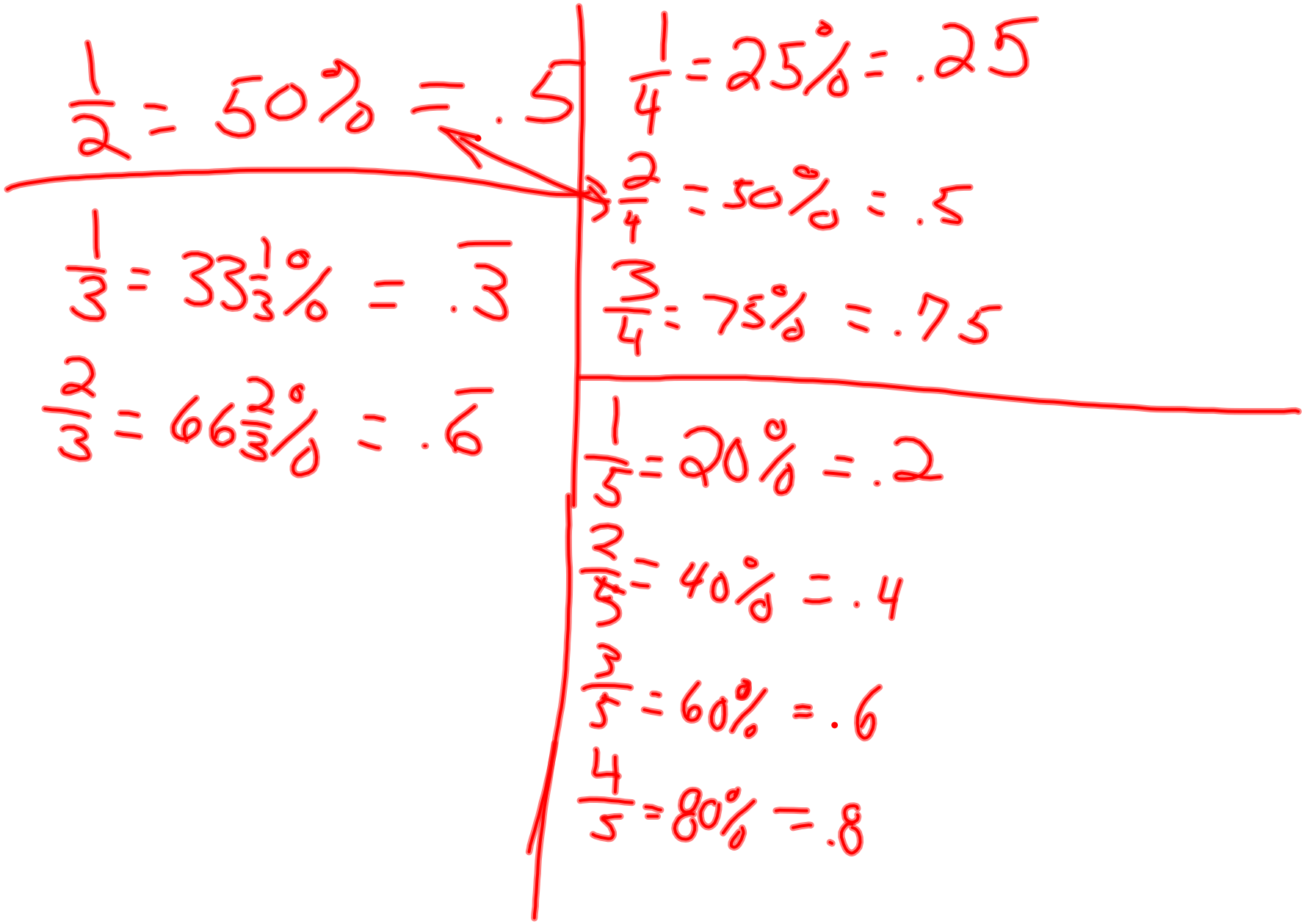
Numbers 20% of 60 is 12.

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

Model



January 23, 2015 Lesson 5.5 Period 3



January 23, 2015 Lesson 5.5 Period 3

$\frac{1}{8} = 12.5\% = .125$

$\frac{2}{8} = 25\% = .25$

$\frac{3}{8} = 37.5\% = .375$

$\frac{4}{8} = 50\% = .5$

$\frac{5}{8} = 62.5\% = .625$

$\frac{6}{8} = 75\% = .75$

$\frac{7}{8} = 87.5\% = .875$

$\frac{8}{8} = 100\% = 1$

January 23, 2015 Lesson 5.5 Period 3

$\frac{1}{9} = .\overline{1}$

$\frac{2}{9} = .\overline{2}$

$\frac{3}{9} = .\overline{3}$

$\frac{4}{9} = .\overline{4}$

$\frac{5}{9} = .\overline{5}$

$\frac{6}{9} = .\overline{6}$

$\frac{7}{9} = .\overline{7}$

$\frac{8}{9} = .\overline{8}$

January 23, 2015 Lesson 5.5 Period 3

$\frac{1}{10} = 10\% = .1$

$\frac{2}{10} = 20\% = .2$

$\frac{3}{10} = 30\% = .3$

$\frac{4}{10} = 40\% = .4$

$\frac{5}{10} = 50\% = .5$

$\frac{6}{10} = 60\% = .6$

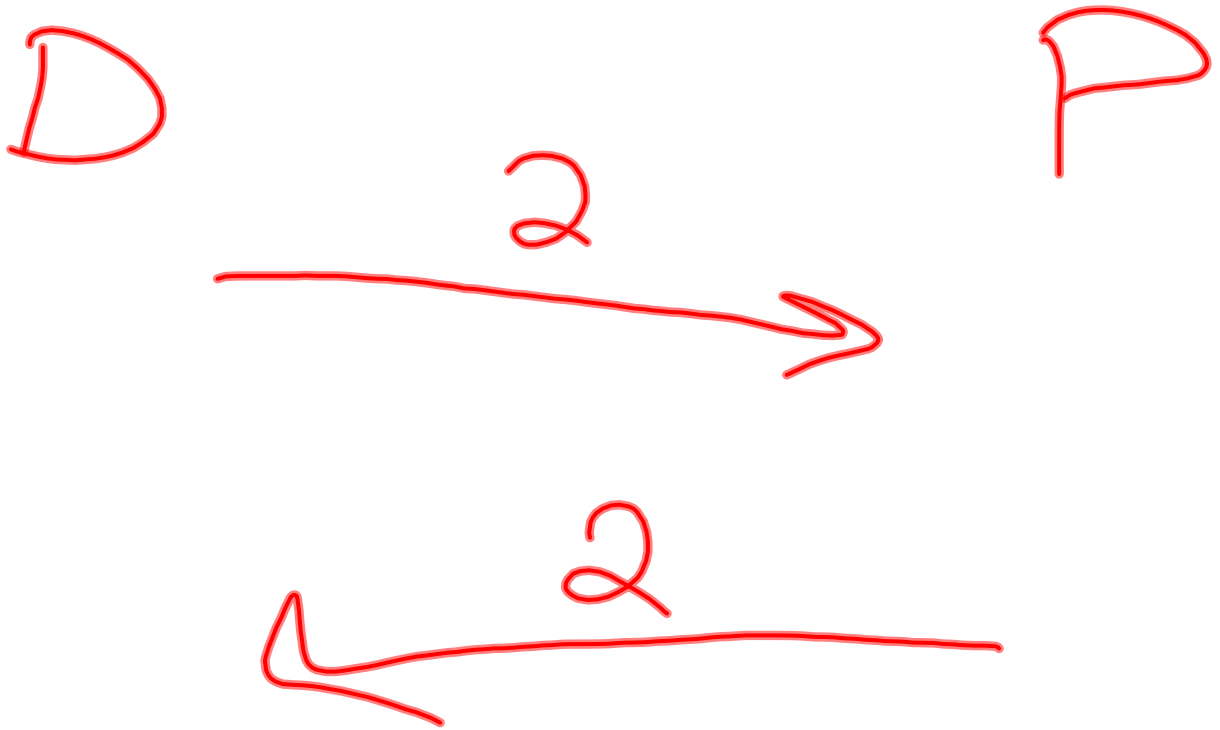
$\frac{7}{10} = 70\% = .7$

$\frac{8}{10} = 80\% = .8$

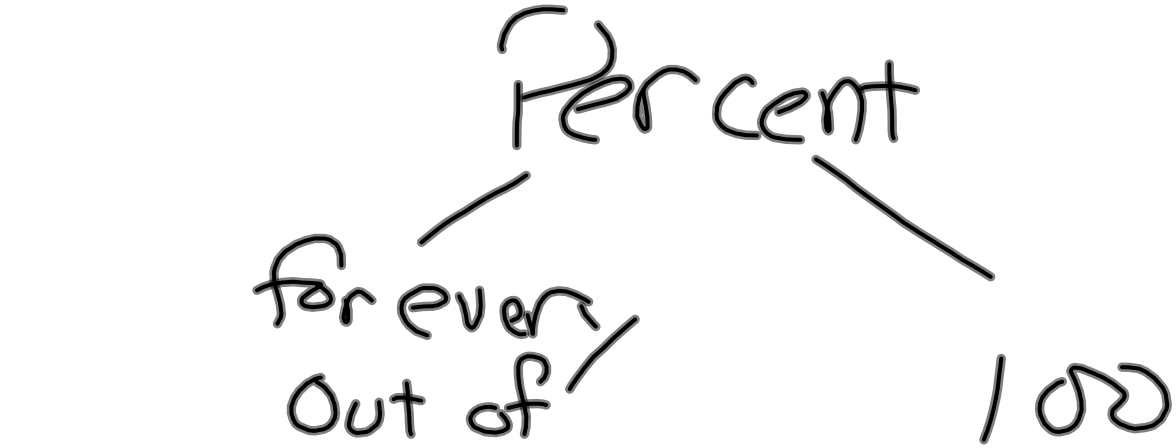
$\frac{9}{10} = 90\% = .9$

$\frac{10}{10} = 100\% = 1$

January 23, 2015 Lesson 5.5 Period 3



January 23, 2015 Lesson 5.5 Period 3



$20\% = \frac{20}{100}$ %

January 23, 2015 Lesson 5.5 Period 3

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

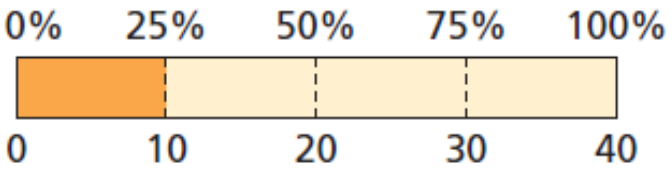
25% of 40 is what number?

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

$= \frac{1 \cdot 40}{4}$ — Divide out the common factor.

$= 10$ — Simplify.

∴ So, 25% of 40 is 10.



You can also use a ratio table to find the percent of a number.

January 23, 2015 Lesson 5.5 Period 3

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.

$$\frac{3}{5} \cdot \frac{150}{1} = \frac{90}{1} = 90$$

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.

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

		÷2	×3
Part	60	30	90
Whole	100	50	150
		÷2	×3

∴ So, 60% of 150 is 90.

January 23, 2015 Lesson 5.5 Period 3

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

January 23, 2015 Lesson 5.5 Period 3

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.

$3 \cdot 2 = 6$

3 Finding the Whole

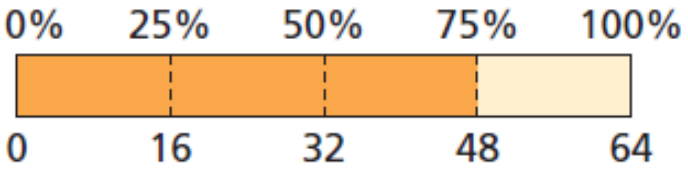
75% of what number is 48?

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

$= \frac{16}{48} \cdot \frac{4}{3}$ Multiply by the reciprocal.

$= 64$ Simplify.

∴ So, 75% of 64 is 48.



January 23, 2015 Lesson 5.5 Period 3

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.

$a \cdot b = c \qquad 3 \cdot 2 = 6$

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.

$72 \div 1\frac{1}{5} =$

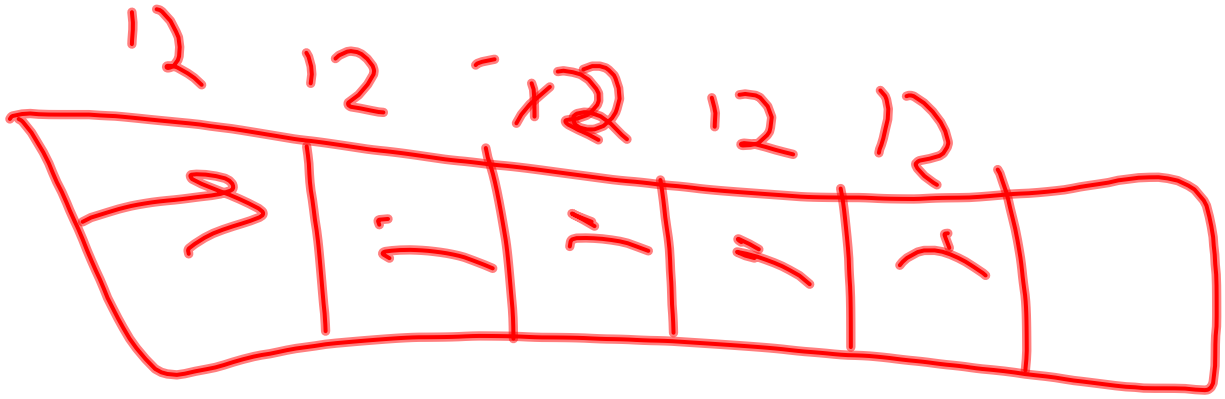
$72 \div \frac{6}{5} =$

$72 \cdot \frac{5}{6} =$

$12 \cdot 5 = 60$

January 23, 2015 Lesson 5.5 Period 3

$\frac{5}{6} \cdot 72$



January 23, 2015 Lesson 5.5 Period 3

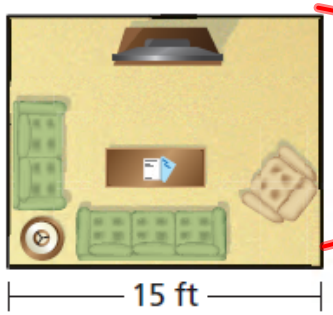
January 23, 2015 Lesson 5.5 Period 3

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?

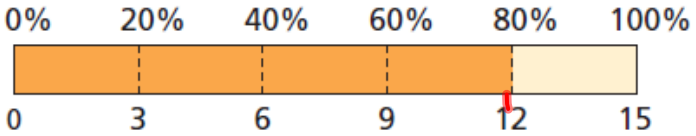
Find 80% of 15 feet.



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

$$= \frac{4 \times 15}{5}$$

$$= 12$$



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.

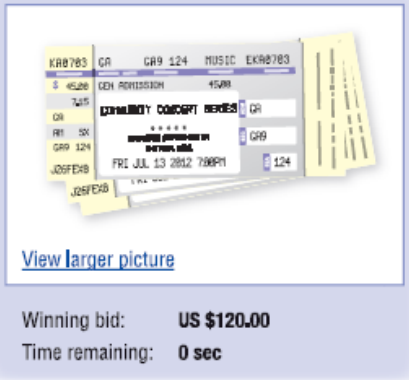
January 23, 2015 Lesson 5.5 Period 3

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.

60% of X = 120

120 ÷ 3
40 120 ÷5 ÷5
1 =$200

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.

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

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

$= 200$ 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).

January 23, 2015 Lesson 5.5 Period 3

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.

January 23, 2015 Lesson 5.5 Period 3

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.

January 23, 2015 Lesson 5.5 Period 3

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 January 15, 2015

Essential Question:

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

Lesson 5.5

January 15, 2015

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
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January 23, 2015 Lesson 5.5 Period 3

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.