

Lesson Title 7.6 Proportion & Problem Solving with Rational Expressions DAY ONE NOTES B2A2 Date _____

OBJECTIVE 1: Solving Proportions

A ratio is the quotient of two numbers or two quantities.

ie: the ratio of 2 to 5 is also the same as 2:5 & $\frac{2}{5}$

If two ratios are equal, then the ratios are in proportion to each other. A proportion is a mathematical statement that two ratios are equal.

ie: $\frac{a}{b} = \frac{c}{d}$

We solve proportions by cross multiplying.

$\frac{a}{b} \neq \frac{c}{d}$	Proportion
$bd(\frac{a}{b}) = bd(\frac{c}{d})$	LCD
$ad = bc$	Simplify cross products.

TASK 1: Solve for x.

a) $\frac{45}{x} = \frac{5}{7}$

$7(45) = 5(x)$

$315 = 5x$

$63 = x$

b) $\frac{36}{x} = \frac{4}{11}$

$36(11) = 4(x)$

$396 = 4x$

$99 = x$

c) $\frac{x-5}{3} = \frac{x+2}{5}$

$5(x-5) = 3(x+2)$

$5x-25 = 3x+6$

$2x = 31$

$x = \frac{31}{2}$

d) $\frac{3x+2}{9} = \frac{x-1}{2}$

$2(3x+2) = 9(x-1)$

$6x+4 = 9x-9$

$13 = 3x$

$\frac{13}{3} = x$

OBJECTIVE 2: Using Proportions to Solve Problems

STEPS:

1. UNDERSTAND the problem
2. Choose a variable to represent the unknown
3. TRANSLATE the problem into an equation
4. SOLVE the equation you created in STEP 3
5. INTERPRET the results in terms of the problem
6. CHECK your solution to make sure it makes sense in the scenario

TASK 2: Follow the steps above to solve the proportions
a) CALCULATING THE COST OF A REDBOX RENTAL
 Not everyone was streaming movies. Many people would rent movies and video games from Redbox in front of Cenex. If renting 3 movies costs \$4.50, how much should 5 movies cost?

(HINT: Create a fraction of your units first)

$$\frac{3}{4.50} = \frac{5}{x} \quad 3x = 5(4.5) \quad x = \frac{5(4.5)}{3} = \boxed{\$7.50}$$

b) DIET PEPSI

Four 2-liter bottles of Diet Pepsi costs \$5.16. How much will seven 2-liter bottles cost?

$$\frac{4}{5.16} = \frac{7}{x}$$

$$4x = 7(5.16)$$

$$x = \frac{7(5.16)}{4} = \boxed{\$9.03}$$

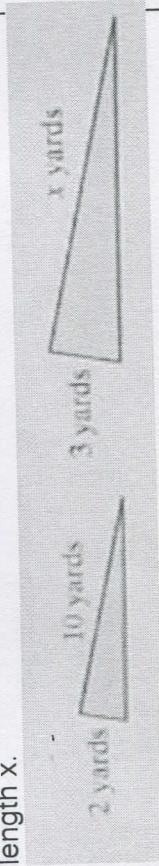
OBJECTIVE 3: Review From Geometry

Similar triangles have the same shape but not the same size. In similar triangles, the measures of corresponding angles are equal, and corresponding sides are proportional. Symbol for similar is \sim .

TASK 3: FIND THE LENGTH OF A SIDE OF A TRIANGLE.

Follow the steps above to solve the proportions.

a) If the following two triangles are similar, find the unknown length x .



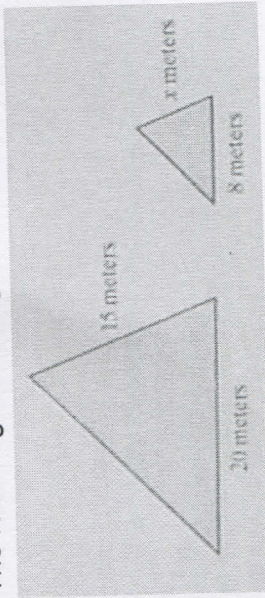
$$\frac{3}{2} = \frac{x}{10}$$

$$\frac{3(10)}{2} = \frac{x}{1}$$

$$x = \frac{30}{2} = \frac{15}{1}$$

$$x = 15$$

b) The following two triangles are similar, find x .



$$\frac{20}{8} = \frac{15}{x}$$

$$20(x) = 8(15)$$

$$20x = 120$$

$$x = 6$$

Common Mistakes:

Still need help with: