January 8, 2015 Period 4 Lesson 14.3

Warm Up

$56 \div 8 =$	$143 \div 13 =$	$36 \div 6 =$	$14 \div 7 =$
$8 \div 1 =$	$150 \div 10 =$	$30 \div 6 =$	$70 \div 7 =$
$84 \div 6 =$	$64 \div 8 =$	$81 \div 9 =$	$10 \div 1 =$
$98 \div 14 =$	$65 \div 13 =$	$30 \div 15 =$	$120 \div 8 =$
$40 \div 8 =$	$5 \div 1 =$	$28 \div 2 =$	$12 \div 12 =$
$48 \div 4 =$	$3 \div 1 =$	$96 \div 12 =$	$24 \div 2 =$
$72 \div 6 =$	$18 \div 6 =$	$24 \div 4 =$	$6 \div 1 =$
$36 \div 3 =$	$24 \div 8 =$	$108 \div 9 =$	$12 \div 6 =$
$18 \div 2 =$	$70 \div 5 =$	$36 \div 4 =$	$12 \div 4 =$
$78 \div 13 =$	$21 \div 7 =$	$40 \div 5 =$	$7 \div 1 =$
$45 \div 3 =$	$77 \div 7 =$	$7 \div 7 =$	$120 \div 15 =$
$28 \div 7 =$	$42 \div 3 =$	$72 \div 8 =$	$52 \div 4 =$
$55 \div 5 =$	$35 \div 5 =$	$20 \div 10 =$	$100 \div 10 =$
$8 \div 8 =$	$182 \div 14 =$	$48 \div 12 =$	$16 \div 4 =$
$140 \div 10 =$	$28 \div 14 =$	$80 \div 10 =$	$54 \div 9 =$
$54 \div 6 =$	$9 \div 9 =$	$75 \div 15 =$	$195 \div 13 =$

Warm Up Answers

$56 \div 8 = 7$	$143 \div 13 = 11$	$36 \div 6 = 6$	$14 \div 7 = 2$
$8 \div 1 = 8$	$150 \div 10 = 15$	$30 \div 6 = 5$	$70 \div 7 = 10$
$84 \div 6 = 14$	$64 \div 8 = 8$	$81 \div 9 = 9$	$10 \div 1 = 10$
$98 \div 14 = 7$	$65 \div 13 = 5$	$30 \div 15 = 2$	$120 \div 8 = 15$
$40 \div 8 = 5$	$5 \div 1 = 5$	$28 \div 2 = 14$	$12 \div 12 = 1$
$48 \div 4 = 12$	$3 \div 1 = 3$	$96 \div 12 = 8$	$24 \div 2 = 12$
$72 \div 6 = 12$	$18 \div 6 = 3$	$24 \div 4 = 6$	$6 \div 1 = 6$
$36 \div 3 = 12$	$24 \div 8 = 3$	$108 \div 9 = 12$	$12 \div 6 = 2$
$18 \div 2 = 9$	$70 \div 5 = 14$	$36 \div 4 = 9$	$12 \div 4 = 3$
$78 \div 13 = 6$	$21 \div 7 = 3$	$40 \div 5 = 8$	$7 \div 1 = 7$
$45 \div 3 = 15$	$77 \div 7 = 11$	$7 \div 7 = 1$	$120 \div 15 = 8$
$28 \div 7 = 4$	$42 \div 3 = 14$	$72 \div 8 = 9$	$52 \div 4 = 13$
$55 \div 5 = 11$	$35 \div 5 = 7$	$20 \div 10 = 2$	$100 \div 10 = 10$
$8 \div 8 = 1$	$182 \div 14 = 13$	$48 \div 12 = 4$	$16 \div 4 = 4$
$140 \div 10 = 14$	$28 \div 14 = 2$	$80 \div 10 = 8$	$54 \div 9 = 6$
$54 \div 6 = 9$	$9 \div 9 = 1$	$75 \div 15 = 5$	$195 \div 13 = 15$

Homework Answers

14.2 Record and Practice Journal

Tell whether the ratios form a proportion.

1. $\frac{1}{5}, \frac{5}{15}$ 2. $\frac{2}{3}, \frac{12}{18}$ 3. $\frac{15}{2}, \frac{4}{30}$ 4. $\frac{56}{21}, \frac{8}{3}$

   no   **yes**   **no**   **yes**

5. $\frac{5}{8}, \frac{62.5}{100}$ 6. $\frac{17}{20}, \frac{90.1}{106}$ 7. $\frac{3.2}{4}, \frac{16}{24}$ 8. $\frac{34}{50}, \frac{6.8}{10}$

   yes   **yes**   **no**   **yes**

Tell whether the two rates form a proportion.

9. 28 points in 3 games;   10. 32 notes in 4 measures;
   112 points in 12 games   12 notes in 2 measures

   yes   **no**

11. You can type 105 words in two minutes. Your friend can type 210 words in four minutes. Are these rates proportional? Explain.

   yes

Learning Objective: Students will be able to write proportions to represent real life situations, and solve by using cross multiplication and inverse operations.

Lesson 14.3   January 8, 2015

Essential Question:

How can you write a proportion that solves a problem in real life?

Lesson 14.3   January 8, 2015

Lesson Objective:

Students will be able to:

write proportions to represent real life situations, and solve by using cross multiplication and inverse operations.

Self-Evaluation Scale

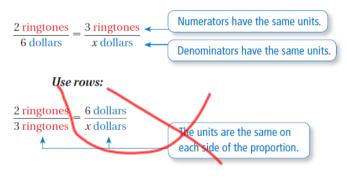| Score	Description
4	I can teach other students how to write proportions to represent real life situations, and solve by using cross multiplication and inverse operations.
3	I can write proportions to represent real life situations, and solve by using cross multiplication and inverse operations.
2	I recognize, but still need help to write proportions to represent real life situations, and solve by using cross multiplication and inverse operations.
1	I do not know how to write proportions to represent real life situations, and solve by using cross multiplication and inverse operations.

January 8, 2015 Period 4 Lesson 14.3

One way to write a proportion is to use a table.

	Last Month	This Month
Purchase	2 ringtones	3 ringtones
Total Cost	6 dollars	x dollars

Use the columns or the rows to write a proportion.

Use columns:

$$\frac{2\ \text{ringtones}}{6\ \text{dollars}} = \frac{3\ \text{ringtones}}{x\ \text{dollars}}$$

Numerators have the same units.

Denominators have the same units.

Use rows:

$$\frac{2\ \text{ringtones}}{3\ \text{ringtones}} = \frac{6\ \text{dollars}}{x\ \text{dollars}}$$

The units are the same on each side of the proportion.
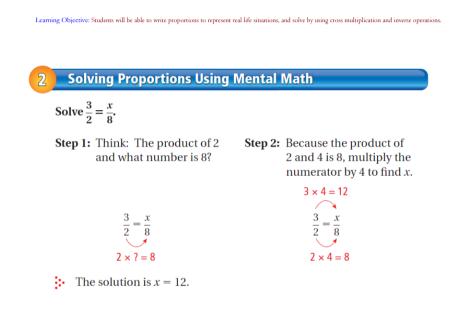
---

1 Writing a Proportion

Black Bean Soup

1.5 cups black beans
0.5 cup salsa
2 cups water
1 tomato
2 teaspoons seasoning

A chef increases the amounts of ingredients in a recipe to make a proportional recipe. The new recipe has 6 cups of black beans. Write a proportion that gives the number x of tomatoes in the new recipe.

Organize the information in a table.

	Original Recipe	New Recipe
Black Beans	1.5 cups	6 cups
Tomatoes	1 tomato	x tomatoes

One proportion is $\dfrac{1.5\ \text{cups beans}}{1\ \text{tomato}} = \dfrac{6\ \text{cups beans}}{x\ \text{tomatoes}}$.

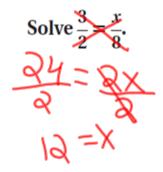**January 8, 2015 Period 4 Lesson 14.3**

2 Solving Proportions Using Mental Math

Solve $\frac{3}{2} = \frac{x}{8}$.

Step 1: Think: The product of 2 and what number is 8?

Step 2: Because the product of 2 and 4 is 8, multiply the numerator by 4 to find x.

$3 \times 4 = 12$

$\frac{3}{2} = \frac{x}{8}$

$2 \times ? = 8$

$\frac{3}{2} = \frac{x}{8}$

$2 \times 4 = 8$

⋮ The solution is $x = 12$.

Reduce, then use mental math

$$\frac{7 \; \cancel{14}}{11 \; \cancel{22}} = \frac{35}{X}$$

$x = 55$

January 8, 2015 Period 4 Lesson 14.3

3 Solving Proportions Using ...

cross multiplication and inverse operations.

Solve $\dfrac{3}{2} = \dfrac{x}{8}$.

$$\frac{24}{2} = \frac{2x}{2}$$

$$12 = x$$

$$\frac{5}{9} = \frac{3}{w}$$

$$\frac{5w}{5} = \frac{27}{5}$$

$$w = 5\frac{2}{5}$$

January 8, 2015 Period 4 Lesson 14.3

Inverse Operation

The operation that reverses the effect of another operation.

Example: Addition and subtraction are inverse operations. Start with 7, then add 3 we get 10, now subtract 3 and we get back to 7.

Another Example: Multiplication and division are inverse operations. Start with 6, multiply by 2 we get 12, now divide by 2 and we get back to 6.

$$\frac{5}{9} = \frac{3}{w}$$

January 8, 2015 Period 4 Lesson 14.3

$$\frac{22}{t} = \frac{2}{7}$$

$$\frac{2t}{2} = \frac{154}{2}$$

$$t = 77$$

Assignment

Complete problems:

8, 10, 16, 18, 20, 22, & 24

on pages 618 - 619 in your Big Ideas Text Book.

$$\frac{12}{14} = \frac{18}{w} \qquad \frac{6}{7} = \frac{18}{w}$$

$$\frac{12w}{12} = \frac{252}{12} \qquad w = 21$$

$$w = 21$$

$$\frac{12}{14} = \frac{17}{w}$$

$$\frac{6}{7} = \frac{17}{w}$$

$$\frac{6w}{6} = \frac{119}{6}$$

$$w =$$

Assignment Answers

8. $\dfrac{12 \text{ points}}{14 \text{ shots}} = \dfrac{18 \text{ points}}{w \text{ shots}}$

10. $\dfrac{15 \text{ miles}}{2.5 \text{ hours}} = \dfrac{m \text{ miles}}{4 \text{ hours}}$

16. $z = 5$

18. $k = 15$

20. $b = 20$

22. **a.** $\dfrac{1 \text{ trombone}}{3 \text{ violas}} = \dfrac{t \text{ trombones}}{9 \text{ violas}}$
    b. 3 trombones

24. no; The solution of that equation is $x = 1.5$, but using mental math, you can see that the solution of the proportion is $x = 24$.

Learning Objective: Students will be able to write proportions to represent real life situations, and solve by using cross multiplication and inverse operations.

Homework

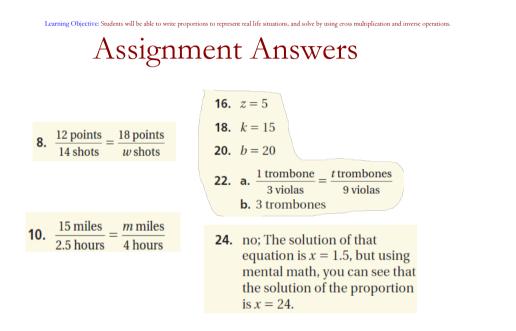In your Big Ideas Record and Practice Journal page 316.