Ratio and Proportion

Similarity & Proportional Reasoning · Grade 6–8

Name: _____ Date: _____

Learning Objectives

- Write ratios in fraction form, colon notation, and verbal phrases
- Simplify ratios to lowest terms using factoring
- Apply ratio and proportion concepts to geometry and word problems

Problems

1. Write the ratio of 3 to 7 in fraction form.

3 to 7

2. Write the ratio 5 : 9 as a verbal phrase and as a fraction.

5 : 9

3. A bag contains 8 red marbles and 12 blue marbles. Write the ratio of red marbles to blue marbles in simplest fraction form.

$\frac{8}{12}$

4. Simplify the ratio of 15 dollars to 25 dollars to its simplest fraction form. Drop the units before simplifying.

$\frac{15}{25}$

5. A rectangle has a length of 7 feet and a width of 5 feet. Write the ratio of width to length in fraction form.

$\frac{\text{width}}{\text{length}} = \frac{5}{7}$

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6. A rectangle has a length of 10 cm and a width of 6 cm. Find the perimeter, then write the ratio of length to perimeter in simplest form.

$$P = 2(l + w) = 2(10 + 6)$$

7. In a class, the ratio of boys to girls is 4 to 5. If there are 20 boys, how many girls are in the class? Set up and solve a proportion.

$$\frac{4}{5} = \frac{20}{x}$$

8. Determine whether the two ratios form a proportion. Show your work by cross multiplying.

$$\frac{6}{9} \text{ and } \frac{14}{21}$$

9. A car travels 150 miles using 5 gallons of gas. At this rate, how many miles can it travel on 8 gallons? Set up and solve a proportion.

$$\frac{150}{5} = \frac{x}{8}$$

10. Two similar triangles are such that the ratio of their corresponding sides is 3 to 5. If the perimeter of the smaller triangle is 36 cm, find the perimeter of the larger triangle. Then write the ratio of the smaller perimeter to the larger perimeter in simplest fraction form.

$$\frac{3}{5} = \frac{36}{x}$$

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Ratio and Proportion — Answer Key

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Answer Key

1. Answer: 3/7
- A ratio of 3 to 7 means 3 is the first value and 7 is the second value.
- The first value becomes the numerator and the second becomes the denominator.
- Fraction form: 3/7

2. Answer: Five to nine; 5/9
- Colon notation a : b is read as 'a to b'.
- So 5 : 9 is read as 'five to nine'.
- As a fraction, 5 is the numerator and 9 is the denominator: 5/9

3. Answer: 2/3
- Ratio of red to blue = 8/12
- Factor both: 8 = 4 × 2 and 12 = 4 × 3
- Cancel the common factor of 4: 2/3

4. Answer: 3/5
- Drop the dollar sign: 15/25
- Factor: 15 = 5 × 3 and 25 = 5 × 5
- Cancel the common factor of 5: 3/5

5. Answer: 5/7
- Width = 5 feet, Length = 7 feet
- Ratio of width to length = 5/7
- Since 5 and 7 share no common factors, the fraction is already in simplest form.

6. Answer: 5/16
- Perimeter = 2(10 + 6) = 2(16) = 32 cm
- Ratio of length to perimeter = 10/32
- Factor: 10 = 2 × 5 and 32 = 2 × 16
- Cancel the common factor of 2: 5/16

7. Answer: 25 girls
- Set up the proportion: 4/5 = 20/x
- Cross multiply: 4x = 5 × 20 = 100
- Divide both sides by 4: x = 25
- There are 25 girls in the class.

8. Answer: Yes, they form a proportion (6 × 21 = 9 × 14 = 126)
- Cross multiply: 6 × 21 = 126 and 9 × 14 = 126

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- Since both products are equal, the ratios are proportional.
- Also note: 6/9 = 2/3 and 14/21 = 2/3, confirming they are equal.

9. Answer: 240 miles

- Write the ratio: 150 miles per 5 gallons = 150/5
- Set up the proportion: 150/5 = x/8
- Cross multiply: 5x = 150 × 8 = 1200
- Divide both sides by 5: x = 240 miles

10. Answer: 60 cm; ratio is 3/5

- For similar triangles, perimeters are proportional to corresponding sides.
- Set up the proportion: 3/5 = 36/x
- Cross multiply: 3x = 5 × 36 = 180
- Divide both sides by 3: x = 60 cm
- Ratio of smaller to larger perimeter = 36/60
- Factor: 36 = 12 × 3 and 60 = 12 × 5; cancel 12 to get 3/5

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