

Ratios/Rates/Proportions

Key

Section 4 - 1

1. In a 40-gallon tank, there are 21 goldfish and 7 tetra fish. Write the ratio of goldfish to tetra fish in simplest form.

$$\frac{21 \div 7}{7 \div 7} = \frac{3}{1}, 3:1, 3 \text{ to } 1$$

2. In a 40-gallon tank, there are 21 goldfish and 7 tetra fish. Write the ratio of tetra fish to the total number of fish.

$$\frac{7 \div 7}{28 \div 7} = \frac{1}{4}, 1:4, 1 \text{ to } 4$$

A soccer league has 25 6th-graders, 30 seventh-graders, and 15 8th-graders. Write each ratio in all three forms.

3. 7th-graders to 8th-graders

$$\frac{30 \div 15}{15 \div 15} = \frac{2}{1}, 2:1, 2 \text{ to } 1$$

4. 6th-graders to total students

$$\frac{25 \div 5}{70 \div 5} = \frac{5}{14}, 5:14, 5 \text{ to } 14$$

5. 7th and 8th-graders to 6th-graders

$$\frac{30+15}{25} = \frac{45 \div 5}{25 \div 5} = \frac{9}{5}, 9:5, 9 \text{ to } 5$$

Section 4 - 2

6. A faucet leaks 400 milliliters of water in 20 minutes. How many milliliters of water does the faucet leak per minute?

$$400 \div 20 = 20 \text{ ml per min.}$$

7. An airliner makes a 3,000-mile flight in 7 hours. What is the airliner's average rate of speed in miles per hour?

$$3000 \div 7 = 428.7 \text{ mi per hour}$$

8. An after-school job pays \$116.25 for 15 hours of work. How much money does the job pay per hour?

$$116.25 \div 15 = \$7.75 \text{ per hour}$$

Find each unit rate.

9. \$300,000 for 1,800 square feet

$$300,000 \div 1,800 = \$166.67 \text{ per sq. ft.}$$

10. \$2,000 in 6 mo

$$2000 \div 6 = \$333.33 \text{ per mo.}$$

Section 4 - 3

Determine whether the ratios are proportional.

11. $\frac{2}{3} = \frac{4}{6}$ *yes*

12. $\frac{3}{4} = \frac{8}{12}$ *no*

Find a ratio equivalent to each ratio. Then, use the ratios to write a proportion.

13. $\frac{1}{3} = \frac{2}{6}$

14. $\frac{9}{21} = \frac{3}{7}$

15. $\frac{10}{4} = \frac{5}{2}$

Section 4 - 4

Use cross products to solve each proportion.

16. $\frac{6}{10} = \frac{36}{x}$
 $36 \cdot 10 = 6 \cdot x$
 $360 = 6x$
 $\div 6 \quad \div 6$
 $60 = x$

17. $\frac{4}{7} = \frac{5}{p}$
 $7 \cdot 5 = 4 \cdot p$
 $35 = 4p$
 $\div 4 \quad \div 4$
 $8.75 = p$

18. $\frac{45}{x} = \frac{15}{3}$
 $45 \cdot 3 = 15 \cdot x$
 $135 = 15x$
 $\div 15 \quad \div 15$
 $9 = x$

Use a proportion to solve the following problems.

19. A certain shade of paint is made by mixing 5 parts red paint with 2 parts white paint. To get the correct shade, how many quarts of white paint should be mixed with 8.5 quarts of red paint?

$\frac{5}{2} = \frac{x}{8.5}$
 $8.5 \cdot 5 = 2 \cdot x$
 $42.5 = 2x$
 $\div 2 \quad \div 2$
 $21.25 = x$
 21.25 qt.

20. If you put an object that has a mass of 40 grams on one side of a balance scale, you would have to put about 18 U.S. dimes on the other side to balance the weight. About how many dimes would balance the weight of a 50-gram object?

$\frac{40}{18} = \frac{50}{x}$
 $50 \cdot 18 = 40 \cdot x$
 $900 = 4x$
 $\div 4 \quad \div 4$
 $225 \text{ dimes} = x$