

Pre-Algebra

Unit 8 Review – Ratios/Rates/Proportions/Scale Drawings



Let's Review

Ratio: a comparison of two numbers

Example: The ratio of consonants to vowels in the alphabet is 21:5

Rate: a comparison of two numbers with two different kinds of units

Example: George can run 15 miles in 2 hours

Unit Rate (*constant of proportionality*): a rate that compares how much of one quantity relates to one unit of the second quantity (we usually **divide** to find a unit rate).

Proportion: two ratios set equal to one another (*cross products are always equal in proportional relationships*)

Proportional Relationships can be modeled using **tables**, **graphs** and **equations** ($y = kx$ where k is the *constant of proportionality* and $\frac{y}{x} = k$).

Directions: Simplify each ratio as a fraction in lowest terms.

1. 30 boys to 50 girls

2. 9 teachers: 180 students

3. 12 to 144

Directions: Calculate a unit rate in each example.

4. \$78 earned in 6 hours

5. 180 revolutions in 4 minutes

6. 170 people on 5 buses

7. 100 yards in 12 seconds

Directions: Solve each proportion.

8. $\frac{2.5}{30} = \frac{x}{96}$

9. $\frac{x}{36} = \frac{10}{30}$

10. $\frac{\frac{1}{2}}{x} = \frac{20}{\frac{1}{4}}$

11. $\frac{8}{x-5} = \frac{4}{x}$

Directions: Determine which product is the better buy by finding each of the unit rates.

12. 12 oz of peanuts for \$2.16 *or* 20 oz of peanuts for \$3.30

13. 7 oz of toothpaste for \$1.80 *or* 10 oz of toothpaste for \$2.75

Directions: Solve each problem. Remember to justify your response either with unit rates or with a proportion (*show all work*).

14. Danielle picked 44 apples in 8 minutes and Laura picked 52 apples in 10 minutes. Who can pick apples faster?

15. Dana read 45 pages of her book in 60 minutes. At this rate, how many pages can Dana read in 3 hours?

16. Mrs. Smith used 2.5 gallons of water to water 30 plants. How much water would she need to water a garden consisting of 96 plants?

17. A $7\frac{1}{2}$ ounce energy drink contains 9 teaspoons of sugar. How much sugar is in one ounce of the drink?

18. Bernie swims 10 laps in $2\frac{1}{2}$ minutes. What is his unit swim rate in laps per minute?

19. Aaron designed a robot for a contest. His robot can move $\frac{3}{5}$ of a meter in $\frac{1}{2}$ second. What is the robot's rate of speed?

20. State whether the relationship displayed in the table is proportional or not. Justify your response.

a)

x	1	2	3	4
y	3	6	12	16

b)

x	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$
y	1	2	3	4

21. Consider the graph and complete a - e.

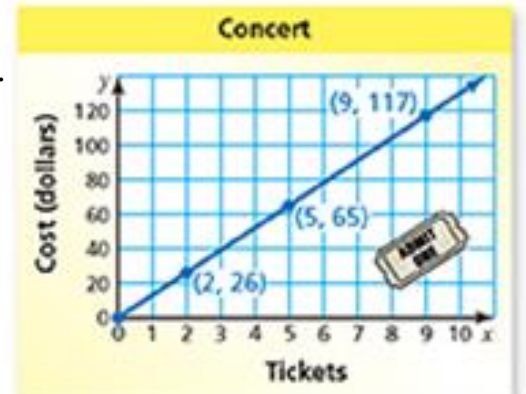
a) Is the relationship in the graph proportional? Justify.

b) Identify one point on the line and explain what it means in the context of the situation.

c) Determine the constant of proportionality.

d) Write an equation that represents the relationship.

e) Use your equation to determine the cost of 15 concert tickets.



22. A map has a scale of 1 inch: 20 miles. If the actual distance between two counties is 50 miles, what would be the scaled distance on the map?

23. A scale model of BMW's new car has a scale of 1:54. If the length of the actual car is 216 inches, what would the length of the model car be?

24. A painting has a scale of 3 ft : 5 yards. What is the scale factor of the drawing?