Math 7
Unit 3 Ratios and Proportional Relationships

Dear Parents,
Below is information regarding Unit 3, Ratios and Proportional Relationships. Look for additional newsletters for future units.

By the end of this unit, students will:
- Compute the unit rate.
- Solve unit rate problems that have fractional quantities.
- Determine if two ratios are in proportion (equivalent).
- Write and solve an equation from a proportional relationship.
- Solve multistep ratio problems using proportions. Focus on simple interest, tax, markups/downs, gratuities and commissions, and fees.
- Compute the actual size of a figure from a scale drawing.

Vocabulary

Constant of proportionality: The constant value of the ratio of two proportional quantities x and y; usually written y = kx, where k is the constant of proportionality. In a proportional relationship, y=kx, k is the constant of proportionality, which is the value of the ratio between y and x.

Direct Proportion (Direct Variation): The relation between two quantities whose ratio remains constant. When one variable increases the other increases proportionally: When one variable doubles the other doubles, when one variable triples the other triples, and so on. When A changes by some factor, then B changes by the same factor: *A=kB*, where k is the constant of proportionality.

Multiplicative inverse: Two numbers whose product is 1. Example: $\left(\frac{3}{4}\right)$ and $\left(\frac{4}{3}\right)$ are multiplicative inverses of one another because $\left(\frac{3}{4}\right) \times \left(\frac{4}{3}\right) = \left(\frac{4}{3}\right) \times \left(\frac{3}{4}\right) = 1$.

Proportion: An equation stating that two ratios are equivalent.

Ratio: A comparison of two numbers using division. The ratio of a to b (where b ≠ 0) can be written as a to b, as $\left(\frac{a}{b}\right)$, or as a:b.

Scale factor: A ratio between two sets of measurements.

Unit Rate: the ratio or comparison of two measurements in which the denominator or 2nd measurement is equal to one.
http://intermath.coe.uga.edu/
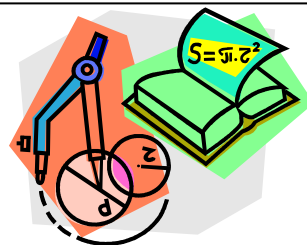
Textbook Connection

McGraw Hill Georgia Math Grade 7: Chapter 5 Lessons 1-7, 9 and Chapter 6
McGraw Hill Textbook Online:
connected.mcgraw-hill.com

Web Resources

- Decimal Operations
- Ratios
- Rates
- Solving Proportions
- Constant of Proportionality
- Simple Interest
- Tax
- Math Dictionary for Kids (online)
- Intermath (Interactive Mathematics Dictionary for middle school)

Instructional Videos:
- Unit Rates and Unit Ratios
- Fraction Tutorials
- Similar Figures and Proportions

Written Tutorials:
- Word Problems - Proportions

Practice Problems

1) Find the unit rate & explain what it represents: 5 gallons of gas cost $17.50.
2) A meal at Applebee's came to $17.50. How much would a 15% tip be for the server?
3) A scale drawing of a room measures 5" x 6". If 1 inch = 2 feet, then what are the actual dimensions of the room?
4) The graph below represents the cost of gum packs as a unit rate of $2 dollars for every pack of gum. The unit rate is represented as $2 per pack. Represent the relationship using a table and an equation.
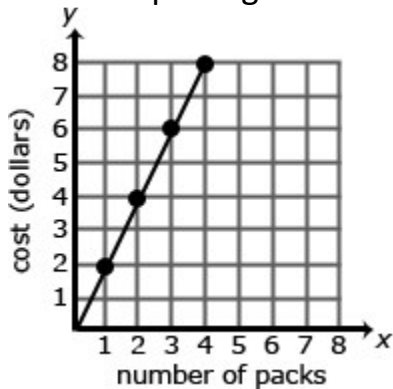
number of packs

Answers

1) $\dfrac{5\ gallons}{\$17.50} = \dfrac{1\ gallon}{\$3.50}$; 1 gallon of gas costs $3.50

2) $17.50(0.15) \approx $2.63

3) $\dfrac{1\ inch}{2\ feet} = \dfrac{5\ inches}{x\ feet}$, x = 10 feet; $\dfrac{1\ inch}{2\ feet} = \dfrac{6\ inches}{x\ feet}$, x = 12 feet; the actual room dimensions are 10' x 12'

4)

Number of Packs of Gum	Cost in Dollars
0	0
1	2
2	4
3	6
4	8

Equation: $d = 2g$, where d is the cost in dollars and g is the packs of gum.