Objective   Solving Equations to Solve Problems

Warm-Up

Determine each quotient using long division.

1. 435 ÷ 25

2. 511 ÷ 30

Equations, Literally

You have already learned a lot of important equations in mathematics. Some of these equations are literal equations. Literal equations are equations in which the variables represent specific measures. You most often see literal equations when you study formulas.

For example, the formula for the area of a triangle, $A = \frac{1}{2}bh$, is a literal equation. The variables in this equation represent the measures of the area, base, and height of the triangle.

1. Consider the formula for area of a parallelogram.
a. Write the formula for area, A, use b to represent the base and h to represent the height.

b. Solve the equation for b.

c. Solve the equation for h.

2. The total cost, t, of an online order is the cost of the items, c, plus the cost of shipping, s.
a. Write an equation to represent the total cost.

b. Solve the equation for the cost of the items.

c. Solve the equation for the cost of shipping.

3. You can calculate the distance, d, of an object traveling at a constant rate by multiplying the rate, r, by the time, t. Write an equation in terms of each quantity.

a. distance   b. rate   c. time

Write and solve an equation for each problem. Show your work and label your answers. Describe the strategy you used to determine each solution.

1. Raul's sister is 6 years older than he is. What is Raul's age if Raul's sister is 19 years old?

2. Approximately $\frac{1}{10}$ of the mass of a medium-sized apple is sugar. What is the approximate mass of a medium-sized apple that contains 19 grams of sugar?

3. Oscar made brownies for his class. He tripled the recipe he normally uses. If he made 36 brownies for his class, how many brownies does his original recipe make?

4. In June of 2016, for every 20 total emails a person received, they could expect to get 11 spam emails. If a person received 300 spam emails in one month, how many total emails did they receive?

5. In Jaden's town, the middle school has 443 more students than the high school. If the middle school has 817 students, how many students are at the high school?
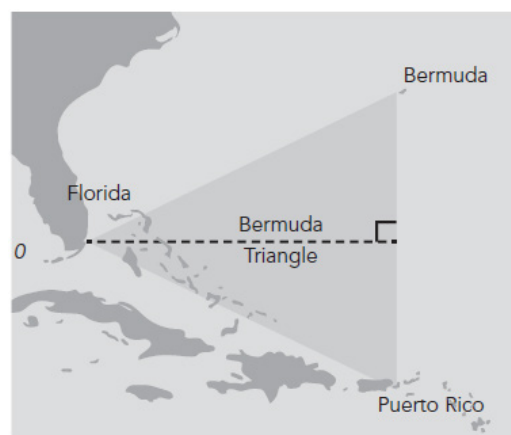
6. The average height of an ostrich, the tallest bird, is 121 inches. The average height of a bee hummingbird, the smallest bird, is 2.75 inches. How many times taller is the ostrich than the bee hummingbird?

For each question, write an equation to represent the situation and then solve it to answer the equation. A situation may require more than one equation.

1. Kendra bought some back-to-school supplies for $1.70. She showed them to her friend Naya: 2 erasers for 2 cents each, 5 markers for 4 cents each. She also bought 8 notepads, but she forgot how much she paid for them. She did not pay sales tax.
Naya said that she was not charged the right amount. How did she know?

2. The Bermuda Triangle is an imaginary triangle connecting Miami, Florida, to San Juan, Puerto Rico, to Bermuda. The Bermuda Triangle covers an area of 454,000 square miles. The dashed line on the map shows a distance of about 926 miles.
What is the approximate distance from Bermuda to Puerto Rico?

LESSON 8.4a
Getting Real

Objective Solving Equations to Solve Problems

Practice

1. Match each inequality with the correct solution.

a. $x < -2$ i. $4x + 12 < 20$

b. $x > 2$ ii. $55 < 35 + 10x$

c. $x > -2$ iii. $-\frac{3}{2}x + 12 > 15$

d. $x > 2$ iv. $-8x < 16$

2. Solve each one-step inequality and graph the solution set on a number line.

a. $x + 7 \geq 13$ b. $-4 > x - 3$

c. $\frac{x}{4} \leq \frac{5}{2}$ d. $18.3 > 6.1x$

e. $3 < \frac{x}{-8}$ f. $-10x \geq 45$