TOPIC 8

LESSON 8.3c

Formally Yours

7.EE.4a

Objective

Using Inverse Operations to Solve Equations

Warm-Up

Solve each equation.

1. $3p = -12$

2. $\frac{4}{5}r = 20$

EXPLORE 4

Solving Literal Equations

You have already learned a lot of important formulas in mathematics. These formulas are also literal equations. Literal equations are equations in which the variables represent specific measures. Common literal equations occur in measurement and geometry concepts.

1. The formula to convert from degrees Celsius to degrees Fahrenheit is $F = \frac{9}{5}C + 32$.

a. Calculate the temperature in Celsius, if it is 39°F.

b. Calculate the temperature in Celsius, if it is 25°F.

c. Solve the equation for the temperature in Celsius.

2. The formula for the perimeter of a rectangle can be written as $P = 2L + 2w$, where l and w represent the length and width of the rectangle.

a. Rewrite the formula by factoring out the coefficient of the variables.

b. Next, solve the equation for the length.

c. Solve the equation in part (a) for the width.

3. The formula for the area of a trapezoid can be written as $A = \frac{1}{2}(b_1 + b_2)h$, where b_1 and b_2 are the lengths of the bases and h is the length of the height of the trapezoid.

a. Rewrite the formula as a product of two factors.

b. Solve the equation for the height of the trapezoid.

c. Solve the equation in part (a) for one of the bases.

4. Solve each equation for the specified variable.

a. $S = 2\pi rh + 2\pi r^2$ for h

b. $V = \pi r^2 h + \frac{2}{3}\pi r^3$ for h.

EXPLORE 5

Solving More Equations

1. Solve each equation. Check your solutions.

a. $2 + 7x = 16$

b. $5 + \frac{1}{2} = 16$

c. $-17 = 2x - 8$

d. $0.5x - 0.3 = 0.2$

e. $-\frac{1}{4} - \frac{1}{2}x = -\frac{19}{4}$

f. $-\frac{2}{5}x + 4 = 18$

g. $-5 = -3(x + 11)$

h. $8(x + 6) = 18$

i. $\frac{1}{2}(5 - x) = \frac{1}{4}$

j. $6.4 = 1.2(4 + 2x)$

Show You KNOW

Get Creative

1. Any equation in the form $ax + b = c$ can be solved in two steps, but do you need to write out both steps to solve the equation?

a. Isolate the variable x, so that it has a coefficient of 1.

b. Use your answer from part (a) to solve $4x + 5 = 61$.

2. Similarly, any equation in the form $a(x + b) = c$ can be solved without writing out both steps of the two-step solution process.

a. Isolate the variable x, so that it has a coefficient of 1.

b. Use your answer to part (a) to solve $4(x - 7) = 20$.

Name: _____ Date: _____ Class: _____

Homework HW

LESSON 8.3c

Formally Yours

Objective Using Inverse Operations to Solve Equations

Practice

4. What is a number that when you multiply it by 0.9 and subtract 6.3 from the product, you get 4.5? Write and solve an equation to solve the riddle.

5. Craig and four of his friends had a car wash to earn some extra money. They split the profits and Craig got an extra $18 to repay his parents for the car wash supplies. If Craig got $32, how much total money did they split among themselves? Write and solve an equation to answer the question.

6. Susana bought a laptop for $500. It was marked $50 off because it was out of the box and slightly scratched. She also got a 20% student discount, which was taken off the original price. What was the original price of the laptop? Write and solve an equation to answer the question.