15-1 Solving Equations Using the Distributive Prop.

Part One:

You can use the Distributive Property to simplify the expressions *a(b+c)* and *a(b-c)*, where *a*, *b*, and c, are numbers

$$a(b+c) = a \cdot b + a \cdot c \qquad a(b-c) = a \cdot b - a \cdot c$$

Some equations are easier to solve if you use the Distributive Property to simplify them.

Example:

Use the Distributive Property to solve $4(8 - c) = 8c + 16 - 6c$

Your Turn:

Use the Distributive Property to solve $3e - 8 = 2(e - 4)$

Part Two:

You can solve an equation with a fraction in multiple ways. One way is to begin by eliminating the fraction from the equation. This is similar to eliminating decimals from an equation by multiplying each term by a power of 10.

To do this, multiply each side of the equation by the denominator of the fraction. You might then have to use the Distributive Property.

To solve equations containing more than one fraction, you can eliminate all fractions by multiplying each side by the least common multiple of the denominators.

$$12 = \frac{3}{4}n + 5$$

Multiply each side by 4. $4(12) = 4\left(\frac{3}{4}n + 5\right)$

Use the Distributive Property. $4(12) = 4\left(\frac{3}{4}n\right) + 4(5)$

Multiply. $48 = 3n + 20$

Subtract 20 from each side. $48 - 20 = 3n + 20 - 20$

Simplify. $28 = 3n$

Divide each side by 3. $\frac{28}{3} = \frac{3n}{3}$

Simplify. $\frac{28}{3} = n$

Example:

Students A and B use different methods to solve the equation $-20 = \frac{x}{2} + 7$. One of the students makes a mistake. Find, describe, and correct the error.

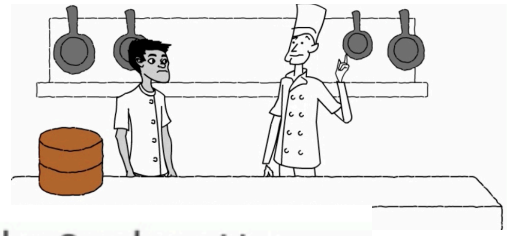
Student A

$$-20 = \frac{x}{2} + 7$$
$$-20 - 7 = \frac{x}{2} + 7 - 7$$
$$-27 = \frac{x}{2}$$
$$2(-27) = \left(\frac{x}{2}\right)2$$
$$-54 = x$$

Student B

$$-20 = \frac{x}{2} + 7$$
$$2(-20) = \left(\frac{x}{2} + 7\right)2$$
$$-40 = x + 7$$
$$-40 - 7 = x + 7 - 7$$
$$-47 = x$$

Part Three:



An apprentice pastry chef has been left alone to make 8 cakes. He cannot remember how much sugar to put in the filling!

He knows the following:

- Each cake (not counting the filling) requires $1\frac{1}{4}$ cups of sugar.
- The head chef told him he would need a total of 12 cups of sugar for all 8 cakes and fillings.

Write an equation to represent the situation. Then find the amount of sugar needed for the filling of one cake.

$$\text{total sugar} = \text{8 cakes} \cdot \left(\text{amount of sugar for one cake} + \text{amount of sugar for one filling} \right)$$

Let f = the number of cups of sugar needed for one filling.

$$12 = 8 \cdot \left(1\frac{1}{4} + f \right)$$

Your Turn:

The length of a rectangle is 7 ft longer than its width. The perimeter of the rectangle is 26 ft. Write an equation to represent the perimeter in terms of its width *w*. What is the length of the rectangle?

A. 3 ft

B. 7 ft

C. 10 ft

D. 19 ft