Warmup $11 / \left(\textbf{\textit{Solution to}} \ \frac{x+11}{3} = 5 \right)$

Derman was asked to solve the equation below. His work is shown. Find his error and correct it.

Equation: $2\frac{1}{4}x = 3$

$$\frac{9}{4}x = 3$$

$$\frac{4}{9} \cdot \frac{9}{4}x = 3 \cdot \frac{4}{9}$$

$$\boxed{x = \frac{12}{27}}$$

Table of Contents

1 and 2-Step Equations

Objective:

- Solve 1 and 2 step equations
- Know how to check a solution

Usain Bolt looked at his watch and saw that he had taken 3,500 steps so far that day. He went running and was able to run 200 steps per minute.

A) **Write an equation where "y" represents the number of steps he has taken today after "x" minutes spent running.**

B) **If Usain's watch showed 9,500 steps after his run, how many minutes did he spend running?**

Analyzing Equations – solving them mentally

 +10 = 55

What does the frog have to equal?

Analyzing Equations – solving them mentally

$$3x + 10 = 55$$

What does the 3x part have to equal?

Analyzing Equations – solving them mentally

$$\frac{x + 5}{2} = 7$$

What does the x + 5 part have to equal?

Analyzing Equations – solving them mentally

$$55 - 2x = 47$$

What does the 2x part have to equal?

Analyzing Equations – solving them mentally

$$\frac{1}{4}x - 18 = 2$$

What does the $\frac{1}{4}x$ part have to equal?

Analyzing Equations – solving them mentally

$$2x - 8 = -2$$

What does the 2x part have to equal?

Analyzing Equations – solving them mentally

$$\frac{3x}{4} = 6$$

What does the 3x part have to equal?

Analyzing Equations – solving them mentally

$$2 \cdot (x - 3) = 42$$

What does the (x – 3) part have to equal?

Analyzing Equations – solving them mentally

$$\frac{x + 1}{4} - 3 = 2$$

What does the (x +1) part have to equal?

Mental Math strategies are great...

- ...but we will be doing more difficult ones that you will NOT be able to do mentally.

- You need to know the official equation solving-steps so that you can do these harder ones.

- The good news is that the "official" equation solving-steps are based directly on these strategies we have been practicing.

- If you understand these connections well, you will have great success in this unit!

Important Mathematical Properties

- (You will not be tested on these)

- **ADDITION PROPERTY OF EQUALITY:**
  - If you add the same number to both sides of an equation, the equation stays true.
- **SUBTRACTION PROPERTY OF EQUALITY:**
  - If you subtract the same number from both sides of an equation, the equation stays true.
- **MULTIPLICATION PROPERTY OF EQUALITY:**
  - If you multiply both sides of an equation by the same number, the equation stays true.
- **DIVISION PROPERTY OF EQUALITY:**
  - If you divide both sides of an equation by the same number, the equation stays true.

Solve the Equation:

If 3x – 9 is 15, then what is the 3x by itself???

$$3x – 9 = 15$$

$$+9 \quad +9$$

$$3x = 24$$

$$\frac{3x}{3} \quad \frac{24}{3}$$

$$x = 8$$

Solve the Equation:

23 = 33 − 4x

Analyze the equation. What does the "4x" part have to equal?

Solve the Equation:

$$\frac{1}{3}x + 3 = 9$$

Solve by multiplying first:

$$\frac{1}{3}x + 3 = 9$$

Examples

SOLVE. Check each answer.

1. $4x - 16 = 20$

        $x = 9$

2. $-15 - 2x = -37$

        $x = 11$

3. $1\frac{3}{4}x - 14 = 21$

        $x = 20$