Section 4.1 – Solving Simple Equations

MPM1D

Part 1: Do It Now

Byron spent a total of $11 on two magazines. The cost of one magazine is $5. You can use an equation to find the cost of the other magazine.

a) Write an equation to represent this situation

b) What value of the variable makes the equation true? Describe the math operations you used to find the value?

Part 2: Keeping Equations Balanced

An equation is still true if you apply identical operations to both sides

$$5 = 5$$

$$5 + 1 = 5 + 1$$

If I add 1 to each side; both sides are still equal

$$5 \times 2 = 5 \times 2$$

If I multiply both sides by 2; both sides are still equal

Solve for x (what value of x makes the equation true):

when solving an equation, the goal is to isolate the variable

$x + 4 = 12$

$x + 4 - 4 = 12 - 4$

Subtract 4 from the left because you will be left with just x by itself because 4 - 4 = 0. That means you will have to subtract 4 from the right as well to keep the equation equivalent

$x = 12 - 4$

$x = 8$

Part 3: Solving Simple Equations Examples

1) $x - 2 = 8$

2) $x + 7 = 5$

3) $-4 + x = -1$

4) $10 + x = 5$

Now You Try!

5) $x - 7 = 8$

6) $x + 5 = 5$

"Just a darn minute! – Yesterday you said that X equals **two**!"

Hopefully you are starting to notice that the trick to isolating a variable is to move numbers away from the variable by applying the _____ operation!

7) $3x = 18$ The opposite of multiplication is: _____

8) $\frac{x}{4} = 3$ The opposite of division is: _____

Now You Try!

9) $-x = 9$

10) $5x = 30$

11) $\frac{x}{7} = 3$

Part 4: Two Step Equations

Isolate variable term first. (you will perform BEDMAS in reverse when isolating variables)

$5x + 25 = 500$

Step 1: Subtract 25 from both sides

Step 2: Divide both sides by 5

12) $2x - 7 = 9$

13) $\frac{x}{2} + 4 = 20$

Remember: isolate variable term first!

14) $16x + 3 = 15$

remember to always put fraction in lowest terms!

Before Moving On…

Solve the following equation:

$\frac{2x}{3} + 7 = 15$

Summary of Key Concepts

- To solve an equation means to find the value of the variable that makes the statement true.
- To solve a one step equation, isolate the variable by performing the opposite operation.
- In a two-step equation, isolate the variable term first, then isolate the variable.
- You can check a solution by substituting the root back in to the equation.