# 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

$$5 = 5$$

$$5+1=5+1$$

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

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

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

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

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

$$x + 4 = 12$$

$$x + 4 - 4 = 12 - 4$$

$$x = 12 - 4$$

$$x = 8$$

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

#### **Part 3: Solving Simple Equations Examples**

1) 
$$x - 2 = 8$$

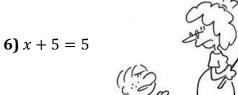
**2)** 
$$x + 7 = 5$$

3) 
$$-4 + x = -1$$

**4)** 
$$10 + x = 5$$

**Now You Try!** 

**5)** 
$$x - 7 = 8$$



"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

5x + 25 = 500

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

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.