***Solving Equations***

Most of the problems you will do in math ask you to solve an equation for a certain variable. Your job as the student is to be able to identify what you’re trying to solve for and get that thing by itself. Let’s look at an example:

Example 1:

Solve for x.

x – 6 = 11

Now the first thing you should ask yourself is “What am I trying to solve for?” Go ahead and write below what you’re solving for.

You should have said x hopefully! Ok, since we are solving for x, our next goal is to get the x alone, all by itself on one side of the equal sign. So as you look at that equation what else is on the side of the equal sign with the x?

Right it’s -6. So our goal then is to move that -6 away from the x and put it on the other side. To do this however we have to perform a math operation. Since the 6 is negative, to get rid of it we have to do the opposite of a negative. So instead of subtracting 6 we’re going to ­\_\_\_\_\_\_\_\_\_\_\_\_ 6 to both sides.

Good so you would then add 6 to both sides and it should look something like this:

x – 6 = 11

 + 6 +6

Go ahead and write above what happens to both sides. On the left side of the equal sign the -6 and the +6 will cancel each other out. This leaves just x on the left side of the equal sign. This is exactly what we wanted! On the right side of the equal sign we get 11 + 6, which is \_\_\_\_\_. Therefore x = 17. You just solved an equation!

Example #2

Solve for x.

3x = 21

What’s the first question you need to ask yourself? Write it below.

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All right so what is next to the x right now on the left side of the equal sign? \_\_\_\_\_\_\_\_\_

Are the 3 and the x adding, subtracting, multiplying, or dividing? Circle the correct response.

Good so if they are multiplied together, what is the opposite of multiplication?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ok so then divide both sides of the equation by 3.

What do you get then for x? x = \_\_\_\_\_\_

Alright I think you got the hang of it.

*Multi-Step Equations*

These are only a tiny bit harder than the ones you’ve been doing and only because you’re adding another step. But I don’t think you’ll have any trouble. Let’s look at an example.

Example #1

Solve for y.

12 = 4 – 2y

What’s the first question you’re asking yourself?

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Good, now here’s where it gets a little tricky. We want to get the y by itself but it has two different things over by it on the right side of the equal sign. What do we do?!

Calm down! Think about how this equation works. Whatever y is, it gets multiplied by -2 first, right? Then that number gets subtracted from 4. So if we are going to do the inverse of this set of steps (which means we want to do the opposite), which step will we undo first?

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That’s right, we want to undo the step with the 4 first. So now just look at that 4. Is it positive or negative? Circle the correct choice.

Alright so what is the opposite of that? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Good then subtract 4 from both sides. Write down what your equation looks like now below:

Now we have 8 = -2y

Now this becomes like all the other ones you have done. Finish solving this equation out below and check your answer. If you don’t get the right answer or are having trouble, raise your hand and I will come help you!

I told you it wasn’t that bad. Finish these practice problems up and you’re all done with this packet. Be sure you are checking your answers every few problems or so!

*Do Problems:* pg 80 # 22-28 evens, 34-40 evens, 42, 44

 pg 87 # 22-28 evens, 30-36 evens, 38, 40

 pg 96 # 24-46 evens

**Equations with Variables on Both Sides**

As you can guess it’s going to get a little bit harder now. Again only by a little bit. Now instead of the variable you’re trying to solve for only being on one side of the equation, it will now be on both sides.

Example #1

Solve for x.

6x – 5 = 2x + 11

Again our goal is the same as it’s always been. We’re trying to solve for x.

Now the way to do this is to get all the things with variables on one side of the equal sign and all the numbers on the other side of the equal sign. So for this example let’s move all the variables to the left side and all the numbers to the right side.

So what thing as a variable on the right side of the equation? \_\_\_\_\_\_\_\_\_\_

Alright is the 2x positive or negative? Circle the correct choice.

Therefore do we have to add or subtract it? Circle the correct choice.

Good subtract 2x from both sides and write down what the equation now looks like below:

Now we have to move the all the numbers to the right side of the equation. What number is on the left side of the equation? \_\_\_\_\_\_\_\_\_\_\_\_\_

What do we have to do to get it over to the right side? \_\_\_\_\_\_\_\_\_\_\_\_\_

Good, then add 5 to both sides of the equation and write down the new equation below:

Now it looks like all the equations you’ve already been solving. Finish this one up and check your answer.

*Do Problems:* pg 103 #16-32 evens, 33