Math 9 – Unit 3: Solving Equations Name: _____

Lesson 3.1: Solving One and Two Step Equations Date: _____

Learning Goal: We are learning to solve one and two-step equations.

In the last unit on Algebra, we learned how to manipulate variables within expressions. We will now look to solve the mystery of what number is hiding behind the variable as we move to equations. An equation is just an expression, but it has an equal sign, thus allowing us to come up with a numerical value for the variable.

A **REALLY** important concept that you will learn is how to **SHOW YOUR STEPS**.

First, we will look at one step equations. In one step equations (sometimes thought of the final step as later our bigger questions will be reduced to a single, last step), you need to look at how the number is interacting with the variable. To "move" the number away from the variable, you do the __inverse__ to both sides of the equation. Keep in mind, an equation is like a balance scale. Everything must always be in balance, so if you add 10 to the left, you must add 10 to the right. Okay, enough talk, time for math!

a) $x+8=12$

$-8 \quad -8$

$\Rightarrow x+8-8=12-8$

$\Rightarrow x=4$

a) $x+8=12$

$x=12-8$

$x=4$

b) $-13=m-7$

$-13+7=m$

$-6=m$

c) $-4y=24$

$y=\frac{24}{-4}=-6$

$y=-6$

d) $\frac{p}{3}=10$

$p=10\times 3=30$

$p=30$

In two step equations, such as $3x-7=8$, two numbers need to be moved away from the variable. Equations employ the backwards cousin to BEDMAS to know what to use when. SAMDEB is the order for solving equations.

$3x-7=8$

$3x=8+7$

$\frac{3x}{3}=\frac{15}{3}$

$x=5$

MTH1W

a) $9-4n=45$

$-4n = 45-9$

$\frac{-4n}{-4} = \frac{36}{-4}$

$n = -9$

b) $15w+12=42$

$15w = 42-12$

$\frac{15w}{15} = \frac{30}{15}$

$w = 2$

CHECK

$w = 2$

Left $= 15w+12$

$= 15(2)+12$

$= 30+12$

$= 42$

Right $= 42$

Left = Right. ✓

c) $\frac{k}{3}-4=17$

$\frac{k}{3} = 17+4$

$\frac{k}{3} = 21$

$k = (21)(3)$

$k = 63$

d) $72=-5q+54$

$72-54 = -5q$

$18 = -5q$

$\frac{18}{-5} = q \rightarrow q = -\frac{18}{5}$

$-3.6 = q$

e) $2.8x-14.4=19.2$

$2.8x = 19.2+14.4$

$2.8x = 33.6$

$x = \frac{33.6}{2.8}$

$x = 12$

f) $3.2+\frac{h}{4.8}=3.45$

$\frac{h}{4.8} = 3.45-3.2$

$\frac{h}{4.8} = 0.25$

$h = (0.25)(4.8)$

$h = 1.2$

Success Criteria:

- I can solve equations using inverse operations
- I can check my answer by substituting my answer into the original equation