Math 9 – Unit 3: Solving Equations Name: Ms. Jacob

Lesson 3.1: Solving Equations Date: Feb 26, 2026

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 you need to look at how the number is interacting with the variable. To "move" or eliminate the number away from the variable, you do the _____ 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.

a) $x+8=12$

$-8 \quad -8$

$x = 12-8$

$x=4$

b) $-13=m-7$

$-13+7=m$

$-6=m$

c) $-4y=24$

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

$y=-6$

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

$p=(10)3$

$p=30$

In two step equations, two numbers need to be moved away from the variable. The key is to move/eliminate the constant away from the variable side. Collect your variables on one side and your constants on the other side.

a) $15w+12=42$

$15w=42-12$

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

$w=2$

CHECK: LS = RS

$15(2)+12$

$30+12$

42

b) $9-4n=45$

$-4n=45-9$

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

$n=-9$

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

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

$k=(21)(3)$

$k=63$

d) $2.8x-14.4=19.2$

$2.8x=19.2+14.4$

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

$x=12$

Whoah! Variables on both sides?!? Again, collect variable on one side, constant on other side.

e) $5x=4x+7$

$5x-4x=7$

$x=7$

f) $2w=0.35-5w$

$2w+5w=0.35$

$\frac{7w}{7}=\frac{0.35}{7}$

$w=0.05$

g) $2m+3m=8m-3$

$2m+3m-8m=-3$

$\frac{-3m}{-3}=\frac{-3}{-3}$

$m=1$

h) $8k-3=4k+17$

$8k-4k=17+3$

$4k=20$

$k=5$

i) $16+3x-9=-3+8x+10$

$16-9+3-10=8x-3x$

$\frac{0}{5}=\frac{5x}{5}$

$x=0$

j) $-29k-18+11=-36k-10k-177$

$-29k+36k+10k=-177+18-11$

$\frac{17k}{17}=\frac{-170}{17}$

$k=-10$

Success Criteria:

- I can solve equations using inverse operations
- I can check my answer by substituting my answer into the original equation
- I can solve equations by grouping variables on one side of the equation, and constants on the other side of the equation