**Day 1 & 2 – Solving One & Two Step Equations**

**Standard(s)**

**MFAEI1.** Students will create and solve equations and inequalities in one variable.

**MFAEI1.**a. Use variables to represent an unknown number in a specified set (conceptual understanding of a variable). **(MGSE6.EE.2, 5, 6)**

Remember, an **expression** is a mathematical “phrase” composed of terms, coefficients, and variables that stands for a single number, such as 3x + 1 or x2 – 1. We use Properties of Operations to *simplify* algebraic expressions. Expressions do NOT contain equal signs.

An **equation** is a mathematical “sentence” that says two expressions are equal to each other such as 3x + 1 = 5. We use Properties of Equality (inverse operations) to *solve* algebraic equations. Equations contain equal signs.

When solving equations, you must perform **inverse operations**, which means you have to perform the operation opposite of what you see. You must also remember the operation you perform on one side of the equation must be performed to the other side.

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| --- | --- |
| **Informal** | **Formal** |
| **Operation** | **Inverse** | **Property** | **General Example** |  **Example 1** |
| Addition |  | Addition Property of Equality | If a = b,then a + c = b + c | If x – 4 = 8, then x = 12 |
| Subtraction  |  | Subtraction Property of Equality | If a = b,then a – c = b - c | If x + 5 = 7, then x = 2 |
| Multiplication  |  | Multiplication Property of Equality | If a = b,then ac = bc | If $\frac{x}{2}=9$, then x = 18 |
| Division |  | Division Property of Equality | If a = b,then $\frac{a}{c}= \frac{b}{c}$ | If 2x = 10, then x = 5 |

**No More “Cancelling”**

When you first learned to solve equations in middle school, you might have used the words “cancel”. We are no longer going to use the word “cancel”. Look at the following examples:



**🡨 Adding the opposite**

 **Additive inverse 🡨 Multiplying by the Reciprocal**

 **Adding to zero Multiplicative Inverse**

 **Divides/Multiplies to one**

|  |  |  |  |
| --- | --- | --- | --- |
| **Additive Inverse** | A number plus its inverse equals 0.  | a + -a = 0 | 7 + -7 = 0 |
| **Multiplicative Inverse****(Reciprocal)** | A number times its reciprocal equals 1.  | a ∙ $\frac{1}{a} $= 1 | 3 ∙ $\frac{1}{3}$= 1 |

**Solving One Step Equations Practice**

**Practice:** Solve each equation.

1. x – 4 = 3 Operation You See: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Inverse Operation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. y + 4 = 3 Operation You See: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Inverse Operation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.  Operation You See: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Inverse Operation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. 6p = 12 Operation You See: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Inverse Operation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Practice:** Solve each equation on your own.

a. x – 6 = 10 b. -5d = 25 c. 8 + m = -4

d.  e. y – (-9) = 2 f. $\frac{1}{3}x=6$