Do Now

Solve the following equations. Don't Check.

1) $x - 7 = -13$

$x - 7 = -13$

$-6 - 7 = -13$

$-13 = -13$ ✓

$x = -6$

2) $14x = -56$

$\frac{14x}{14} = \frac{-56}{14}$

$x = -4$

3) $\frac{x}{4} = -10$

$4 \cdot \frac{x}{4} = -10 \cdot 4$

$x = -40$

4) $-17x = -204$

$\frac{-17x}{-17} = \frac{-204}{-17}$

$x = 12$

Lesson #50 – Solving Two Step Equations

Two Step Equations are equations that take two steps to solve.

Parts of a two step equation:

$$3x - 7 = 20$$

coefficient, variable, constant

- **Variable:** a letter that stands for a number.
- **Coefficient:** the number that multiplies the variable.
- **Constant:** The term without a variable.

Example 1) Identify the variable, coefficient, and constant in the following equation: $6x - 8 = 22$

Variable: x Coefficient: 6 Constant: -8

Example 2) Solve and check: $8x + 7 = 31$

Steps to solving a two step equation:

Steps	Example
1) Move all of the constant terms to one side of the equal sign by using either addition or subtraction.	$8x+7=31$, $-7\ \ -7$
2) Isolate the variable by using either multiplication or division.	$\frac{8x}{8}=\frac{24}{8}$, $x=3$
3) Check your solution	$8x+7=31$, $8(3)+7=31$, $24+7=31$, $31=31$ ✓

Example 3) Solve and Check: $4+\frac{x}{5}=0$

$4+\frac{x}{5}=0$

$-4\ \ -4$

$5\left(\frac{x}{5}\right)=(-4)5$

$x=-20$

Check

$4+\frac{x}{5}=0$

$4+\frac{-20}{5}=0$

$4+(-4)=0$

$0=0$

Example 4) Ken said -20 is the solution to the equation $-4=\frac{x}{20}-5$.

Part A: Is Ken correct? No

$-4=\frac{-20}{20}-5$

$-4=-1-5 \rightarrow -4\neq -6$

Part B: If Ken is incorrect, what is the actual solution to the above equation?

$-4=\frac{x}{20}-5$

$+5\ \ +5$

$20(1)=\left(\frac{x}{20}\right)20$

$x=20$

$-4=\frac{20}{20}-5$

$-4=1-5$

$-4=-4$ ✓

Now, You Try!

Directions: Solve and check the following equations.

5) $-15 = 4x + 5$

$-5 \quad -5$

$\frac{-20}{4} = \frac{4x}{4}$

$x = -5$

$-15 = 4(-5) + 5$

$-15 = -20 + 5$

$-15 = -15$ ✓

6) $-6x + 10 = -104$

$-10 \quad -10$

$\frac{-6x}{-6} = \frac{-114}{-6}$

$x = 19$

$-6(19) + 10 = -104$

$-114 + 10 = -104$

$-104 = -104$ ✓

7) $\frac{x}{9} - 1 = -2$

$+1 \quad +1$

$9\left(\frac{x}{9}\right) = (-1)9$

$x = -9$

$\frac{x}{9} - 1 = -2$

$\frac{-9}{9} - 1 = -2$

$-1 - 1 = -2$

$-2 = -2$ ✓

8) $\frac{x}{-4} + 8 = 5$

$-8 \quad -8$

$-4\left(\frac{x}{-4}\right) = (-3)-4$

$x = 12$

$\frac{x}{-4} + 8 = 5$

$\frac{12}{-4} + 8 = 5$

$-3 + 8 = 5$

$5 = 5$ ✓

9) $9x + 9 = 9$

$-9 \quad -9$

$\frac{9x}{9} = \frac{0}{9}$

$x = 0$

$9x + 9 = 9$

$9(0) + 9 = 9$

$0 + 9 = 9$

$9 = 9$ ✓

10) $-9x - 13 = -103$

$+13 \quad +13$

$\frac{-9x}{-9} = \frac{-90}{-9}$

$x = 10$

$-9x - 13 = -103$

$-9(10) - 13 = -103$

$-90 - 13 = -103$

$-103 = -103$ ✓

11) Consider the following equation: $-9 = \frac{x}{5} - 14$

~~Part A: Which two mathematical properties will be used to solve the equation above?~~

Part B: Solve and check the equation above.

$-9 = \frac{x}{5} - 14$

$+14 \quad +14$

$5(5) = \left(\frac{x}{5}\right)5$

$x = 25$