Solving Linear Equations

A **linear equation in one variable (x)** is an equation that can be written in the form:

_____

Ex 1.

Why is $2x + 3 = 17$ a linear equation?

Ex 2.

Solve and check: $2x + 3 = 17$

Examples of **sets**

- $\{5,7,8,10,27\}$
- $\{2, -1\}$
- $\{1,2,3\} = \{2,1,3\}$
- $\{\}$ or $\emptyset$ means **empty set**
- $\mathbb{R}$ means the set of all real #'s (ex: $0, 3, \frac{1}{2}, -0.2, \pi, ...$)

Solving Linear Equations

1. _____ both sides.

2. _____ so that variable terms are on one side, and constants are on the other.

3. _____ by coefficient of variable term.

Ex 3.

Solve and check: $2x + 5 - x = 2x + 13 + 3x$

Ex 4.

Solve and check: $2(x - 1) + 3 = x - 3(x + 1)$

Ex 5.

Solve and check: $\dfrac{x+1}{4} = \dfrac{1}{6} + \dfrac{2-x}{3}$

Ex 6.

Try to solve: $x + 3 = x + 2 + 1$. What happened, and what does it mean?

Ex 7.

Now try to solve: $x = x + 7$. What happened this time, and what does it mean?

An equation that is _____ true is called an _____ .

An equation that is _____ true is called a _____ .

An equation that is _____ true is called an _____ .

Ex 8.

Suppose that the following formula models Math 71A enrollment (E), given the number of bad jokes (x) that have been told: $E = -2x + 36$.

When will the enrollment fall to 10?

Practice

1. Solve and <u>check</u>: $5y - 2 = 9y + 2$

2. Solve and <u>check</u>: $2 - (7x + 5) = 13 - 3x$

3. Solve: $2x - \frac{2x}{7} = \frac{x}{2} + \frac{17}{2}$ (Hint: clear the fractions first by multiplying by the LCD)

4. For the following equation…

   a) Find the solution set.

   b) Determine whether the equation is an identity, conditional equation, or inconsistent equation.

   $4x + 7 = 7(x + 1) - 3x$

5. For the following equation…

   a) Find the solution set.

   b) Determine whether the equation is an identity, conditional equation, or inconsistent equation.

   $4(y + 5) = 21 + 4y$