

Linear Equations

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

ex:

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

$x^2 + 2x = 5$ is **not** a linear equation

$\frac{1}{x} = 6$ is **not** a linear equation

$|2x + 6| = 0$ is **not** a linear equation

Ex 1.

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: $0, 3, \frac{1}{2}, -0.2, \pi, \dots$)

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 2.

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

Ex 3.

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

Ex 4.

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

Ex 5.

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

Ex 6.

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

An equation that is _____ true is called an _____.

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An equation that is _____ true is called a _____.

Practice

1. Solve and check: $5y - 2 = 9y + 2$

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

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

4. Solve: $4x + 7 = 7(x + 1) - 3x$

5. Solve: $4(y + 5) = 21 + 4y$

6. Solve: a) $20x = -35$ b) $-2.1x = 6.09$ c) $\frac{3}{4}x = 6$ d) $\frac{x}{5} = 2$ e) $-x = -13$