# Algebra: Linear Equations

**Vocabulary**

| | |
|---|---|
| Equation | A mathematical statement of **equality** of two algebraic expressions.<br>Example: $5x+3=27-x$ |
| Solution | Any number that satisfies an equation (makes the equation **true**).<br>Example: 4 would make the equation $5x+3=27-x$ true. |
| Solving the equation | The process of finding the solution for an equation. |
| Linear equation in one variable | Equations of the form: $ax+b=0$ and $a\neq 0$<br>Examples: $x+7=0$ $5x-15=0$ |

To determine if a given number is a solution to a linear equation, check to see if the number satisfies the equation (makes the equation true) by replacing the variable in the equation with the number.

Example:

Is 5 a solution for $5x - 15 = 0$ ? Replace x with 5: $5(5) - 15 = 0$

$25 - 15 = 0$

$10 = 0$ This is FALSE.

Therefore, 5 is NOT a solution for $5x - 15=0$

Is 3 a solution for $5x - 15 = 0$ ? Replace x with 3: $5(3) - 15 = 0$

$15 - 15 = 0$

$0 = 0$ This is TRUE.

Therefore, 3 IS a solution for $5x - 15=0$

TRY: Determine if the given number in { } is a solution for the equation.

$4 - x = -8$ { 12} $-5x = -25$ {5}

$-x^2 = 36$ {-6} $x + 3 + 4x = 7 + 3x$ {2}

TRY: Label each as an expression, a linear equation, or an equation that is NOT linear.

$7x - 4 = 6 + 2x$ Expression – Linear Equation – Equation, but not linear

$9x + 5x - 8 + 3$ Expression – Linear Equation – Equation, but not linear

$-x^2 = 36$ Expression – Linear Equation – Equation, but not linear