EQUATION:

1. _has an equal sign_
2. _two expressions that equal each other_
3. _solve for the variable using_
   opposite operations

$$ADD \longleftrightarrow SUBTRACT$$

$$MULTIPLY \longleftrightarrow DIVIDE$$

$$EXPONENTS \longleftrightarrow ROOT$$

Linear Equation:

involves one variable and real numbers
General or Standard form $Ax + B = C$

Steps to Solving Linear Equations:

1. _clear fractions - multiply by LCD_
2. _simplify each side - combine like terms (PEMDAS)_
3. _isolate variable (letter by itself)_
4. _check your answer_

What are like terms? same _variable_   and same _exponent_

Solve the equations

ex. $2x + 6 = 10$
      $-6 \quad -6$
      $\dfrac{2x}{2} = \dfrac{10}{2}$

      $X = 5$

ex. $4x - 2x - 5 = 4 + 6x + 3$
      $2x - 5 = 7 + 6x$
      $-6x \qquad\qquad -6x$
      $-4x - 5 = 7$
        $+5 \quad +5$
      $\dfrac{-4x}{-4} = \dfrac{12}{-4}$

      $X = -3$

ex. $2(x - 5) + 3x = x + 6$

$2x - 10 + 3x = x + 6$
$5x - 10 = x + 6$
$\underline{-x \qquad\qquad -x}$
$4x - 10 = 6$
  $+10 \quad +10$
$\dfrac{4x}{4} = \dfrac{16}{4}$

  $X = 4$

multiply parentheses using distributive property.

ex. $3(2x+1) - 2(x-2) = 5$

$6x + 3 - 2x + 4 = 5$

$4x + 7 = 5$

$\quad\quad -7 \quad -7$

$\dfrac{4x}{4} = \dfrac{-2}{4}$

$x = \dfrac{-2}{4} = \dfrac{-1}{2}$

ex. $\dfrac{3x}{4} + \dfrac{5x}{2} = 13$

$4 \cdot \dfrac{3x}{4} + \dfrac{5x}{2} \cdot 4 = 13 \cdot 4$

$3x + 10x = 52$

$\dfrac{13x = 52}{13 \quad\quad 13}$

$x = 4$

ex. $\dfrac{8x}{3} - \dfrac{2x}{4} = -13$

$12 \cdot \dfrac{8x}{3} - \dfrac{2x}{4} \cdot 12 = -13 \cdot 12$

$32x - 6x = -156$

$\dfrac{26x = -156}{26 \quad\quad 26}$

$x = -6$

ex. $-2x + 5x - 9 = 3(x-4) - 5$ $5x + 4x + 12 = 3(3x + 4)$

$3x - 9 = 3x - 12 - 5$

$3x - 9 = 3x - 17$

$\underline{-3x \qquad\qquad -3x}$

$-9 = -17$ if you get $0 = 0$

                                                    $-9 = -9$

false, no solution $\emptyset$ then this is true,

contradiction   infinite number of

                                                   solutions, identity

ex. $6x + 2(x-2) = 9x + 4$

$6x + 2x - 4 = 9x + 4$

$8x - 4 = 9x + 4$

$\underline{\quad +4 \qquad\qquad +4}$

$8x = 9x + 8$

$\underline{-9x \quad -9x}$

$\dfrac{-1x}{-1} = \dfrac{8}{-1}$

$x = -8$ if you get a solution

                            then it's called conditional