

MATH 1314 – COLLEGE ALGEBRA
SECTION 2.2 LINEAR EQUATIONS IN ONE VARIABLE – PART I

- Expression: any combination of operations, variables and numbers.
- Equation: A mathematical statement that sets two expressions equal to one another.
- Solution (aka: root): any number that satisfies an equation.
- Solution Set: the set of all solutions of an equation.
- Solve: The process used to find the solution set of an equation.
- Restrictions (i.e. values of the variable that are excluded from the set of possible solutions):

Ex: Find the restrictions

(a) $\sqrt{x} + 4 = \frac{12}{y - 17}$

(b) $3x - 14 = x + 5$

(c) $\frac{8}{9}x + 2 = 12$

(d) $\frac{3x}{x - 1} - \frac{5}{x + 3} = 3$

- Properties of Equality: If a, b, c are real numbers and $a = b$,

$$a + c = b + c$$

$$a - c = b - c$$

$$\frac{a}{c} = \frac{b}{c}, c \neq 0$$

$$ac = bc$$

■ There are three types of equations:

Ex: Solve $13x - 88 = 11 + 12$

Type of Equation	Definition	Example
Identity	True for all real values of the variable	$6x = 4x + 2x$ Soln: All real numbers
Conditional	True for only some values of the variable	$4x = 2x + 8$ Soln: $x = 4$
Contradiction or Inconsistent	No real number is a solution	$x - 2 = x$ Soln: No solution.

Ex: Solve

(a) $16(1 + x) = 16(x + 2) - 11$

(b) $\frac{x+1}{x-2} = \frac{3}{x-2}$

(c) Solve for s : $P = L + \frac{si}{f}$

$$(d) \frac{x+2}{x+3} + \frac{1}{x^2+2x-3} = 1$$

$$(e) \frac{2x+3}{x^2+5x+6} + \frac{3x-2}{x^2+x-6} = \frac{5x-2}{x^2-4}$$