

Determining Types of Solutions Without Graphing

Convert each equation to slope-intercept form, then compare the slopes and y-intercepts

SLOPE	Y-INTERCEPT	EXISTENCE OF SOLUTION	Number OF SOLUTIONS	Graph
Different	Same or Different	Consistent	Independent (One - Point of Intersection)	Intersecting Lines
Same	Same	Consistent	Dependent (Infinite - All points that lie on the line)	Coinciding Lines
Same	Different	Inconsistent	No solution	Parallel Lines

Example: a)
$$\left. \begin{array}{l} y = -x + 6 \\ y = x - 2 \end{array} \right\} \text{ slopes are different; y-intercepts are different}$$

Consistent; Independent – 1 ordered pair solution; Intersecting Lines

b)
$$\left. \begin{array}{l} 2x - 3y = 6 \\ 6x - 9y = 36 \end{array} \right\} \text{ slopes are the same; y-intercepts are different}$$

Inconsistent; No Solution; Parallel Lines

c)
$$\left. \begin{array}{l} 3x + 5y = 15 \\ 6x + 10y = 30 \end{array} \right\} \text{ slopes are the same; y-intercepts are the same}$$

Consistent; Dependent – infinitely many solutions; Coinciding Lines