



# Math Study Strategies

## Systems of Equations

### A System of Equations Can be Solved By:

- **Graphing:** graph the equations on the same coordinate system and find the point(s) of intersection.
- **Addition/Subtraction:** add or subtract the two equations and solve the resulting equation for the remaining variable.
- **Substitution:** substitute for x and y.

### Systems of Equations

Type of System	Number of Solutions	Graph
Consistent	One unique solution	Lines intersect
Dependent	Infinite many solutions	One line for both equations
Inconsistent	No solution	Lines are parallel

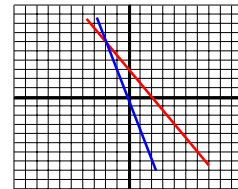
### Examples

**Ex1**  $3x + 2y = 6$ ,  $-3x - y = 0$

$$\begin{array}{r} 3x + 2y = 6 \\ -3x - y = 0 \\ \hline y = 6 \end{array}$$

$$\begin{array}{r} 3x + 2(6) = 6 \\ 3x + 12 = 6 \\ 3x = -6 \\ x = -2 \end{array}$$

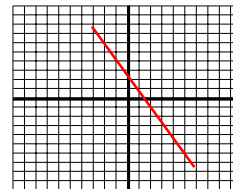
Solution is  $(-2, 6)$



The system is **consistent** and has one unique solution

**Ex 2**  $4x - 3y = 6$ ,  $-4x + 3y = -6$

$$\begin{array}{r} 4x - 3y = 6 \\ -4x + 3y = -6 \\ \hline 0 = 0 \end{array}$$

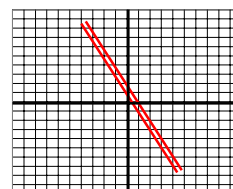


Same line for both equations

The system is **dependent** and has infinite many solutions

**Ex 3**  $-8x - 4y = -6$ ,  $8x + 4y = 3$

$$\begin{array}{r} -8x - 4y = -6 \\ 8x + 4y = 3 \\ \hline 0 = -3 \end{array}$$



The lines are parallel

This is a contradiction. Zero can't be -3

The system has no solution and is called **inconsistent**