

Solving Systems of Equations

graphing

- put in $y = mx + b$
- graphing y-intercept
- graph slope $\frac{\text{Rise}}{\text{Run}}$
- find the point where they meet and write as an ordered pair

Substitution

- if one variable is alone, plug in to the other side of the equation

$$y = 5x + 4$$

$$y = 7x + 6$$

$$5x + 4 = 7x + 6$$

solve for x

$$5x + 4 = 7x + 6$$

$$-7x - 4 \quad -7x + 4$$

$$\frac{-2x}{-2} = \frac{2}{-2}$$

$$x = 1$$

$$y = 7x + 6$$

$$y = 7(1) + 6$$

$$y = -7 + 6$$

$$y = -1$$

$$(-1, 1)$$

Elimination

- Make two perfect opposite w/ b

$$2(3x + 3y = 18)$$

$$3(2x - 2y = 4)$$

$$6x + 6y = 36$$

$$6x - 6y = 12$$

$$\frac{12x}{12} = \frac{48}{12}$$

$$x = 4$$

$$6x + 6y = 36$$

$$6(4) + 6y = 36$$

$$24 + 6y = 36$$

$$24 \quad -24$$

$$\frac{6y}{6} = \frac{12}{6}$$

Solving Systems of Equations:

Graphing method	Substitution method	Elimination method
<ol style="list-style-type: none">1. Put in $y=mx+b$ form by solving for y using inverse operations	<ol style="list-style-type: none">1. If one variable is alone, plug into the other equation.	<ol style="list-style-type: none">1. Make sure you have two perfect opposite variables
<ol style="list-style-type: none">2. Graph the y intercept and slope of each line of the same graph.	<ol style="list-style-type: none">2. Solve for the variable as if you were solving a multi step equation	<ol style="list-style-type: none">2. Multiply whole equation by a number to make variable a perfect opposite
<ol style="list-style-type: none">3. Find the point of intersection	<ol style="list-style-type: none">3. Plug in new value to original equation and solve for the other variable	<ol style="list-style-type: none">3. Add equations together (cancel out opposites) and solve for the variable that is left over
<ol style="list-style-type: none">4. Write solution as an (x,y) ordered pair	<ol style="list-style-type: none">4. Write solution as an (x,y) ordered pair	<ol style="list-style-type: none">4. Plug in new value to original equation and solve for the other variable
		<ol style="list-style-type: none">5. Write solution as an (x,y) ordered pair

Examples: