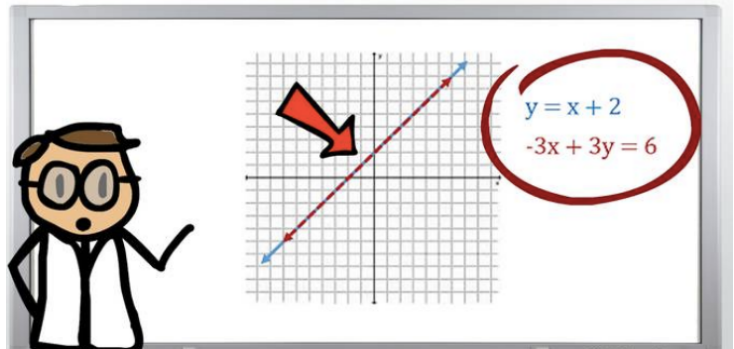
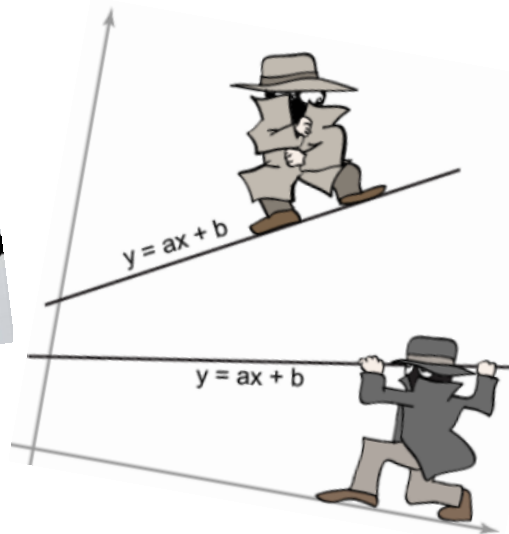
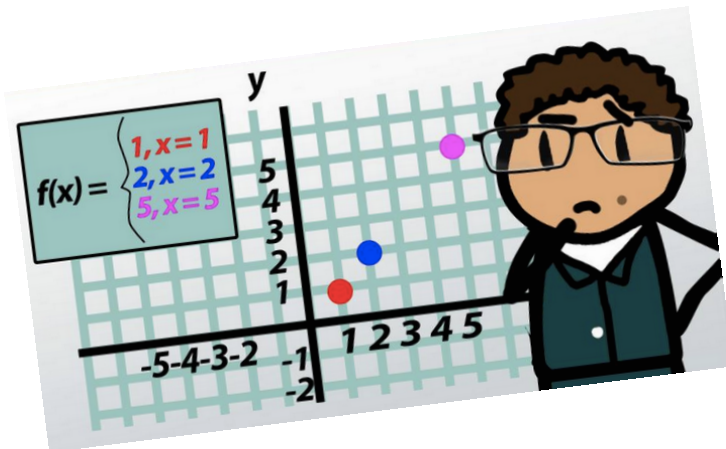


GRAPHING LINES



SEMINAR NOTES Learning Guide 8

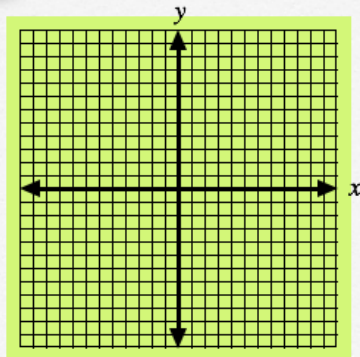


Linear Relations Graphing Package

The Coordinate Grid

The x and y axis divide the coordinate grid into 4 quadrants, numbered counter clockwise from the top right.

Ex. Label the 4 quadrants.



Plotting Coordinates

Each ordered pair (x, y) has 2 parts to locate a point.

- The first part, x , describes the horizontal value of the coordinate.
- The second part, y , describes the vertical value of the coordinate.

Ex.

Graph the following points on the coordinate grid.

$(2, 3)$ $(3, 5)$ $(4, 7)$ $(5, 9)$

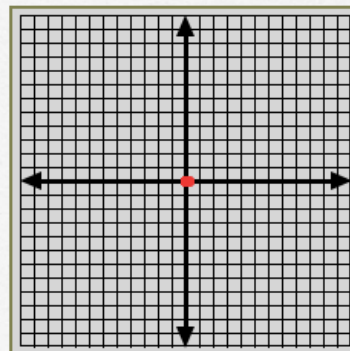
$(2, 3)$

$(3, 5)$

$(4, 7)$

$(5, 9)$

Plot points on the coordinate grid.



Graphing Using Tables ($y = mx + b$)

A linear equation, when graphed, will result in a straight line.

- Choose x -values, starting with zero. If it works evenly go up by the LCD of the equation.
- Solve for y and fill in the coordinate (x, y) .
- Plot the points, draw the line (if graphed over the real numbers).

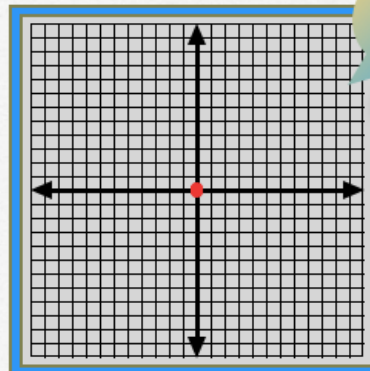
Build table.

Ex. Graph the following linear equation: $y = 2x - 4$.

Choose x , start with 0, go up by the LCD.

x		y	(x, y)
0	$y = 2() - 4$		
1	$y = 2() - 4$		
2	$y = 2() - 4$		
3	$y = 2() - 4$		

Draw the line.

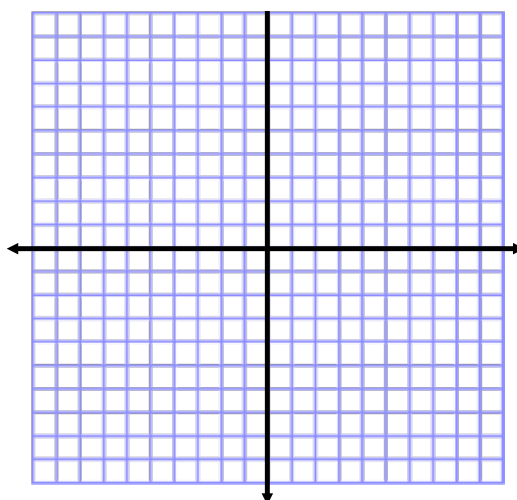




Try

Make a table of values using $x = 0, 1, 2, 3$ to graph the equation $y = 3x - 6$.

x		y	(x, y)
0			
1			
2			
3			



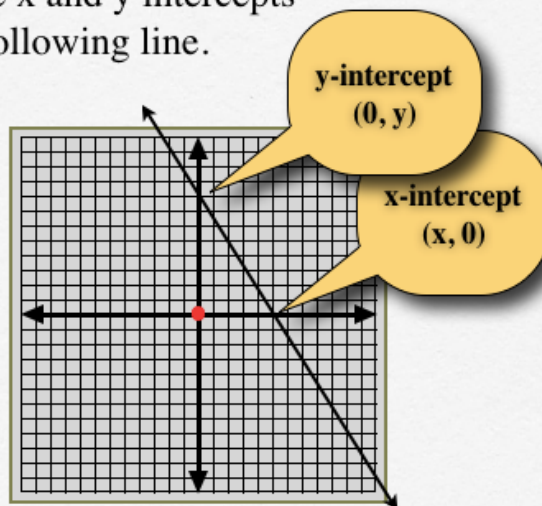
X and Y Intercepts

The x-intercept happens when $y = 0$. $(x, 0)$

The y-intercept happens when $x = 0$. $(0, y)$

Ex.

Find the x and y intercepts of the following line.

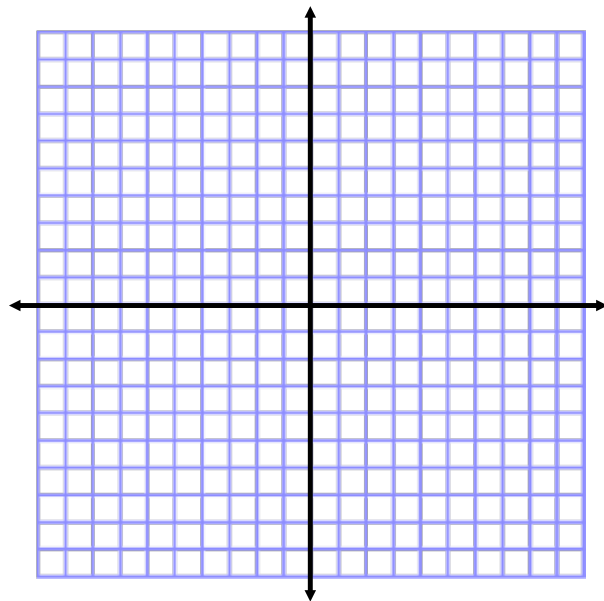




Try

Make a table of values using $x = 0, 1, 2, 3$ to graph the equation $\frac{1}{2}x + y = 2$.

x		y	(x, y)
0			
1			
2			
3			



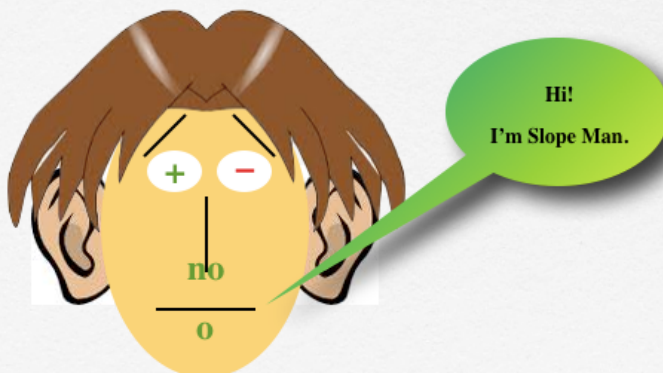
Types of Slope

There are four types of slope.

- **Positive** - a line that rises to the right.
- **Negative** - a line that falls to the right.
- **Undefined** - a vertical line.
- **Zero** - a horizontal line

Ex.

Define the 4 types of slope.



Finding the Slope Given a Graph

The slope of a line is the measure of how steep a line is.

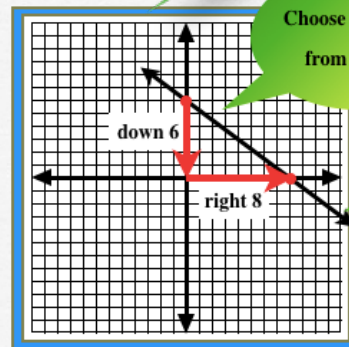
- Choose 2 coordinates on the line.
- Calculate the run and rise.
- Write the slope in the form of $\frac{\text{rise}}{\text{run}}$.

Ex. Find the slope of the given line.

$$m = \frac{\text{rise}}{\text{run}}$$

$$m = \frac{-6}{+8} = \frac{-3}{4}$$

Reduce the fraction.



Choose two points from the line.

Calculate the rise and run.

Check Slope Man.

Finding the Slope Given Two Points

The slope of a line is the measure of how steep a line is.

- Write the slope formula.
- Substitute (x_1, y_1) & (x_2, y_2) into the formula.
- Calculate and write the slope as a reduced fraction.

Ex.

Find the slope of the line that passes through the points $(4, -5)$ & $(-2, 3)$.

Substitute into the formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{-}{-} = \frac{8}{-6} = \frac{-4}{3}$$

Calculate and reduce the fraction

Graphing a Line Given a Point and a Slope

Graphing a line from a point and a slope is like giving directions to someone, "From here, do these steps."

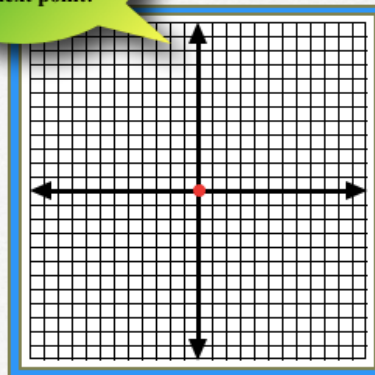
- Graph the given point.
- Break the slope into its vertical and horizontal components to get to the next points.
- Draw the line.

Plot the
point.

Use the slope to locate
the next point.

Ex. Draw the line that passes through (4, -2) with a slope of $\frac{2}{5}$.

$$m = \frac{2}{5}$$



Rearranging Equations into $y = mx + b$

One way of finding the slope without getting points or a graph of a line is to change the equation into $y = mx + b$ form.

- Move the x term and the constant to the right side
- Divide both sides by the coefficient of y .

Change to slope-intercept form.

Ex.

Given the equation, $2x + 3y = 6$, rearrange the equation into $y = mx + b$ form.

Graphing Equations Using $y = mx + b$

To graph a line you need two things, a starting point and a slope.

- Write the equation in $y = mx + b$ form and identify the **y-intercept** (b) and the **slope** (m).
- Plot the point and use the slope to get the next point ($m = \text{rise}/\text{run}$).

Change to slope-intercept form.

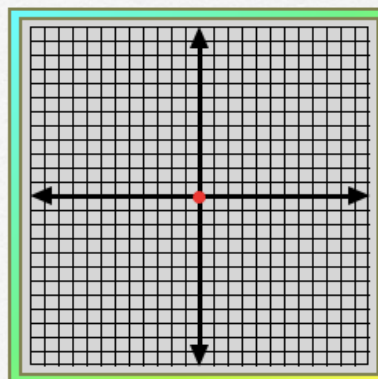
Ex.

Given the equation, $4x + 6y = 12$, graph the line without using a table of values.

Slope =

Y-intercept =

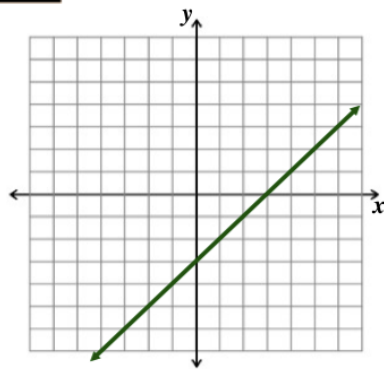
Plot the y-intercept.





Try

Use the linear relation graphed below to determine the following values:



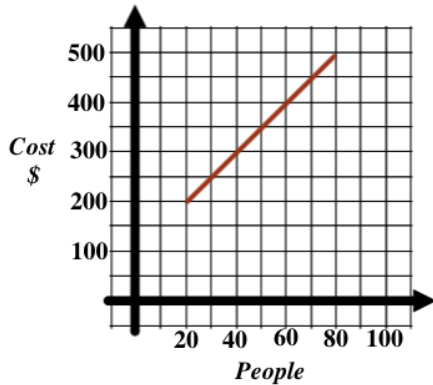
Find x if $y = 2$

Find x if $y = -1$

Find y if $x = 0$

Find y if $x = -3$

Jaiden rents a hall to host a party. Use the graph below to extrapolate or interpolate the following:



Find the cost of the hall if no people attend the party.

Find the cost if 100 people attend the party.

Find the cost if 50 people attend the party.

Find the number of people you could host if you had \$400.

