

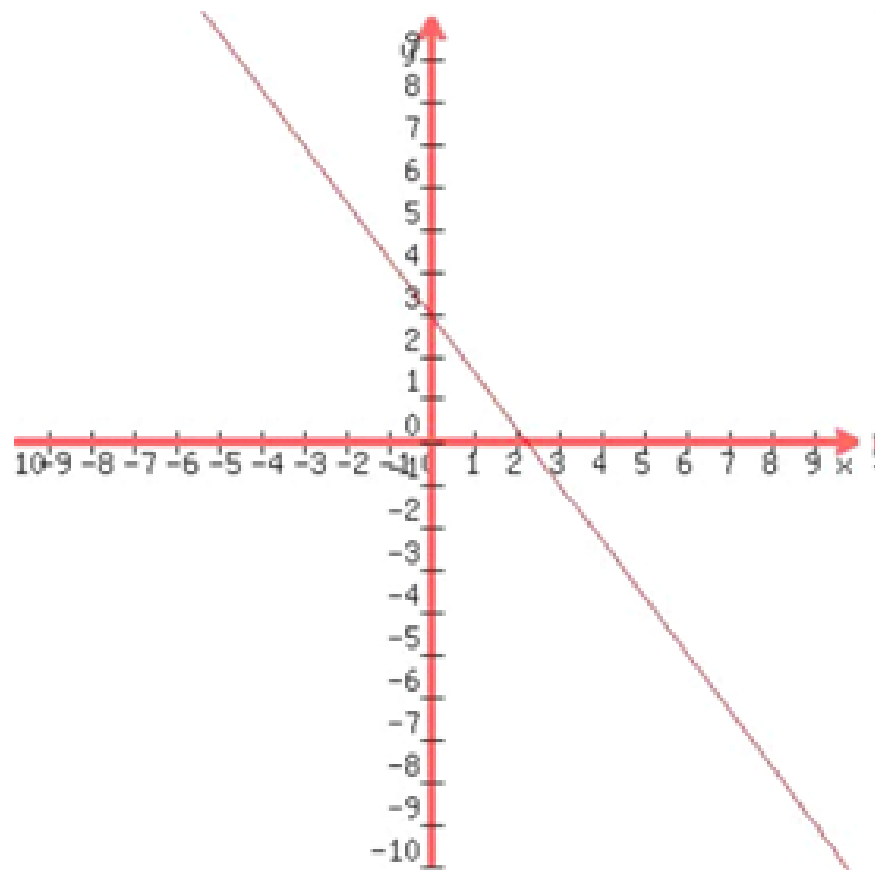
Linear Equations, Slope, and X & Y Intercepts

Objectives:

- ~ Find the Slope of a line
- ~ State whether an equation is Linear
- ~ Find x and y intercepts of a line
- ~ Graph a line by x and y intercepts

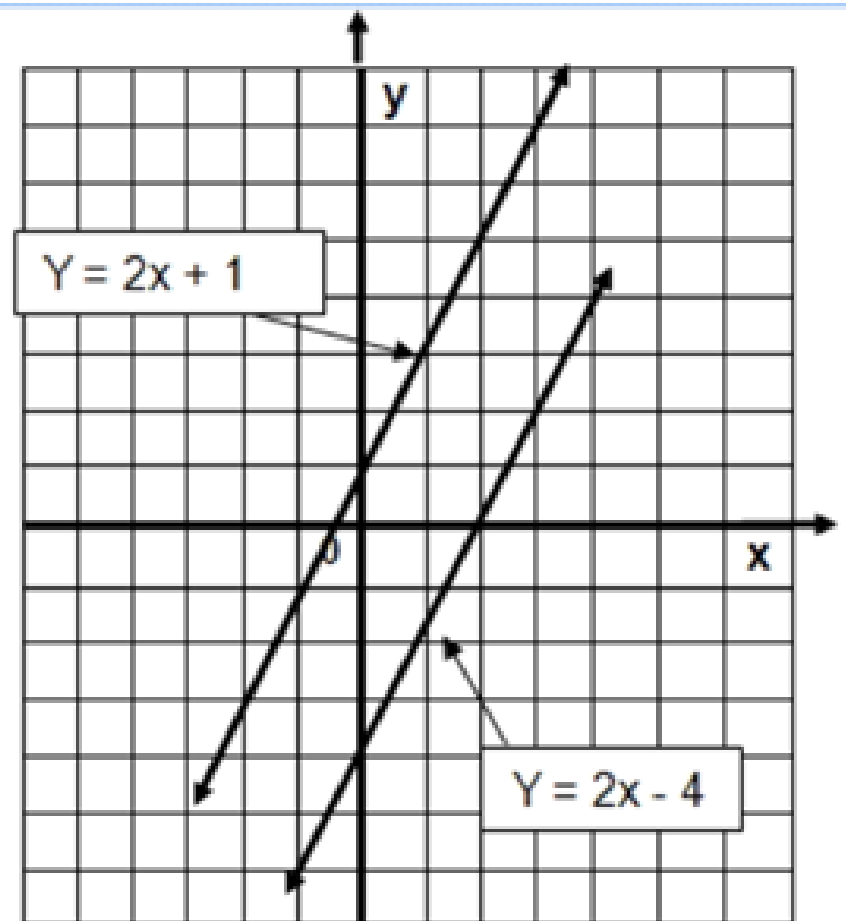
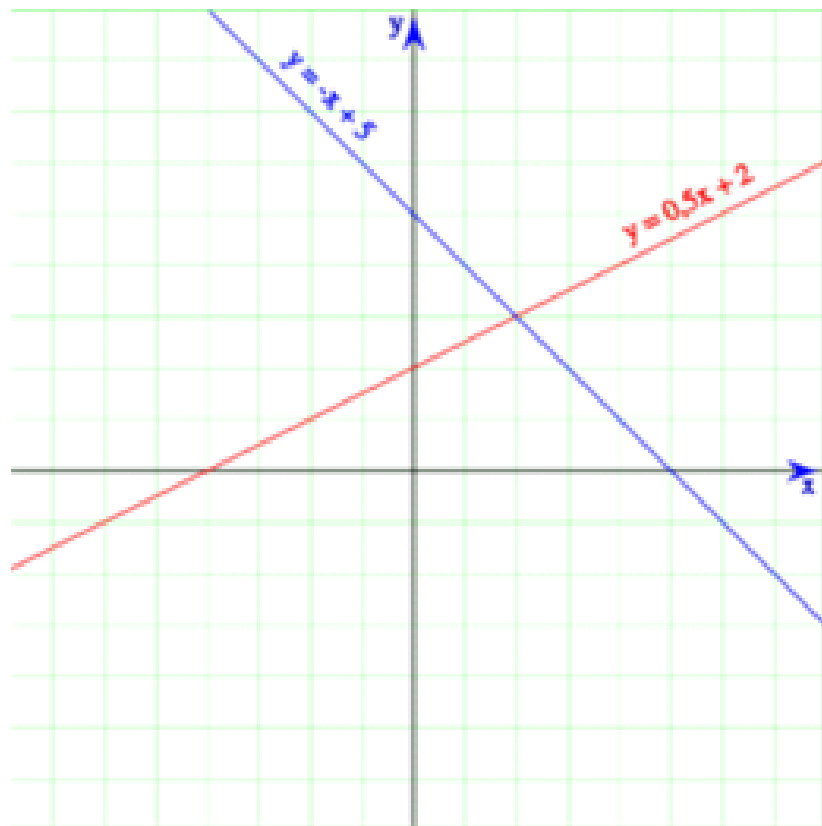
Lesson 6: Section 2.2 & 2.3

Linear Equations: when graphed, a linear equation forms a straight line.

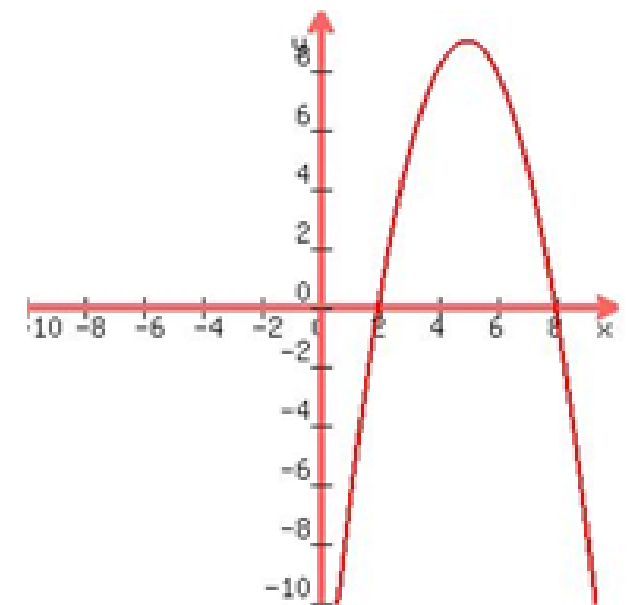
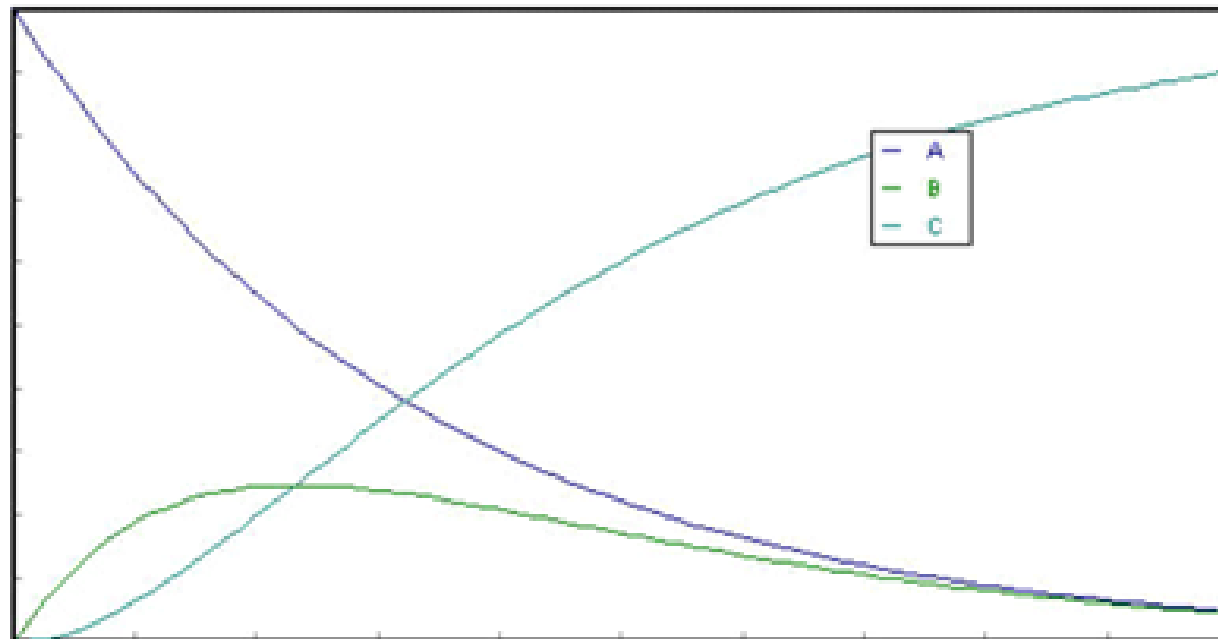


Lesson 6: Section 2.2 & 2.3

Graph examples:



Graph Non-examples:



How can we tell from just an equation?

A linear equation needs to have one or two variables. They are usually “x” and “y”. You cannot have more than two variables.

Standard Form: $Ax + By = C$,
where A, B, C are Real numbers and A, B are not 0

How can we tell from just an equation?

A linear equation CANNOT have:

- Powers (exponents) on variables
- Square roots on variables
- Dividing by variables
- Multiplying variables
- Variables in the denominator of a fraction

Linear Equation Examples:

$$y = 5x - 7$$

$$3y = 4^2x$$

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

$$7n - 8m = 4 - 2m$$

$$3^2x + 4y = 1$$

$$42y + 21x = 14$$

Linear Equation Non-Examples: Why do these not work?

$$y = 5xy - 10$$

$$42y^2 + 21x^2 = 14$$

$$y = \frac{3}{x}$$

$$3y = 4x + 3z$$

$$3x^2 + 4y = 1$$

$$8m = 4 - 2m^2$$

Your turn: Linear Equation or not?

a.) $y = 3x + x$

b.) $x = \frac{1}{y}$

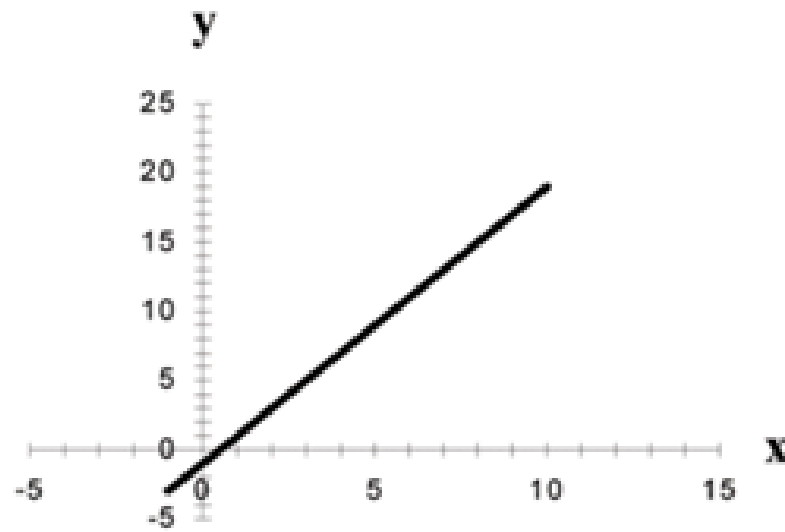
c.) $4y = 3x + yx$

d.) $10^2y - 3x = 2$

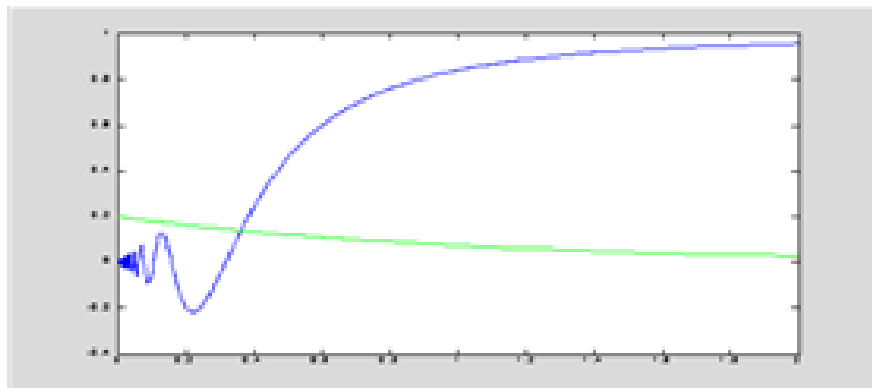
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Your turn: Linear Equation or not?

a.)



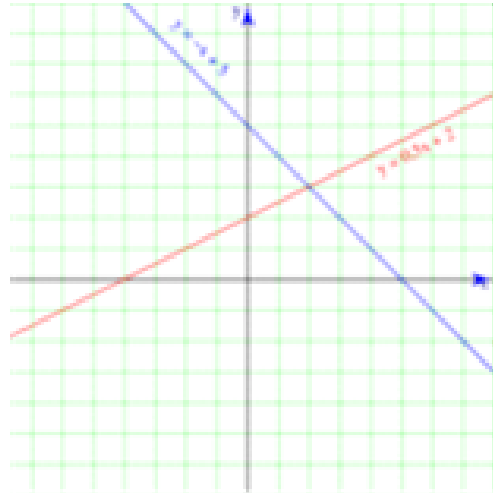
b.)



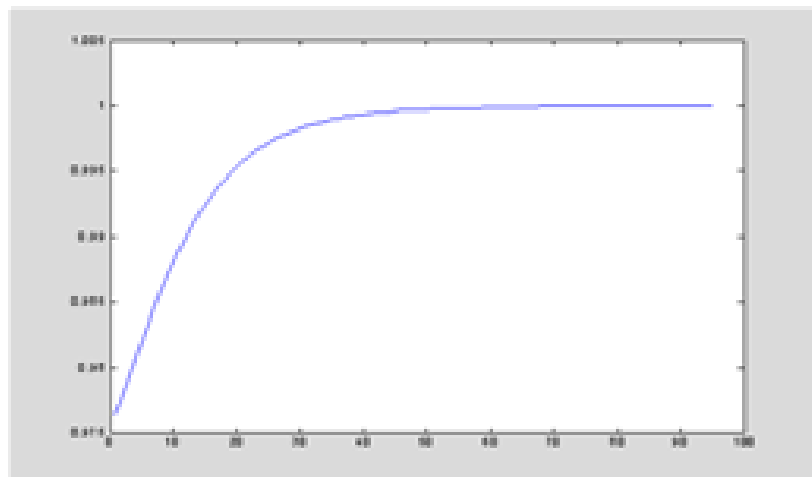
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Your turn: Linear Equation or not?

a.)



b.)

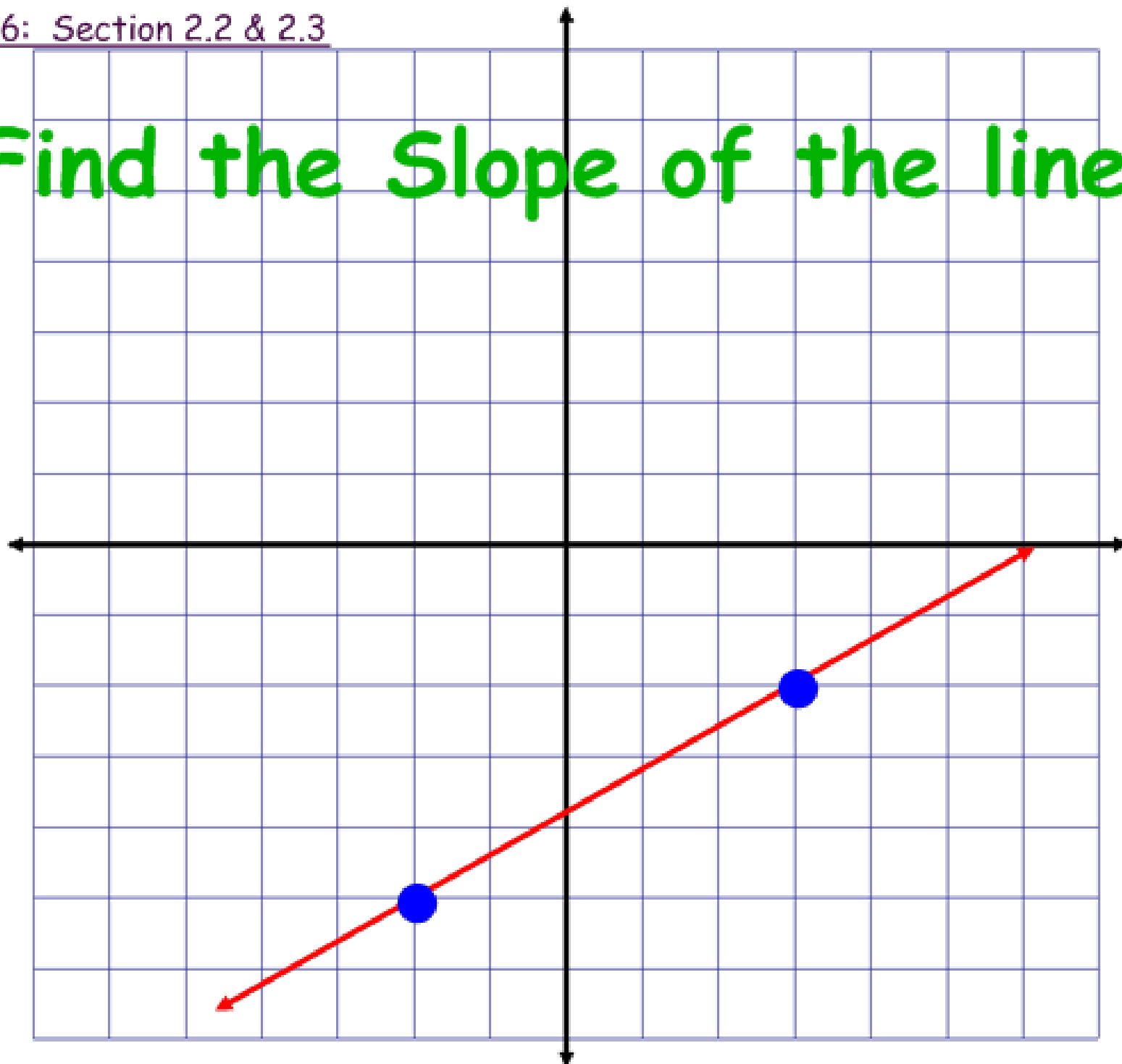


Slope = m

$$m = \frac{\text{Rise}}{\text{Run}}$$

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

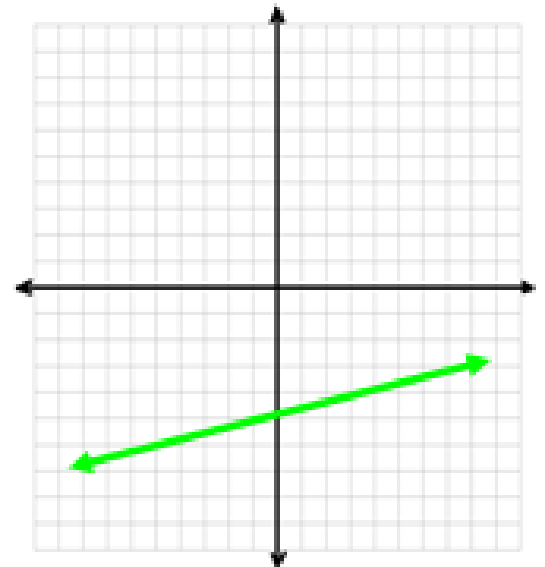
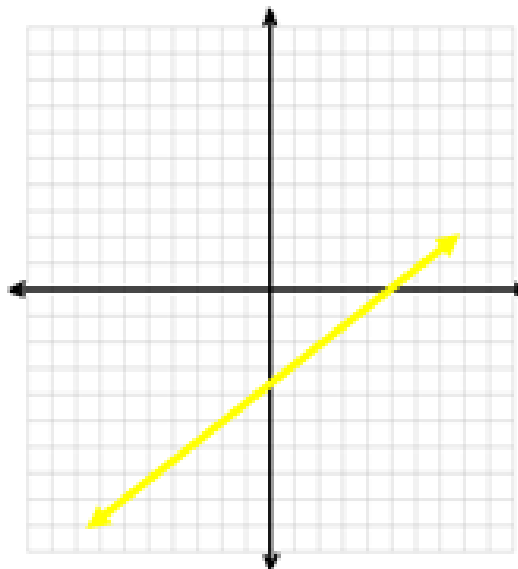
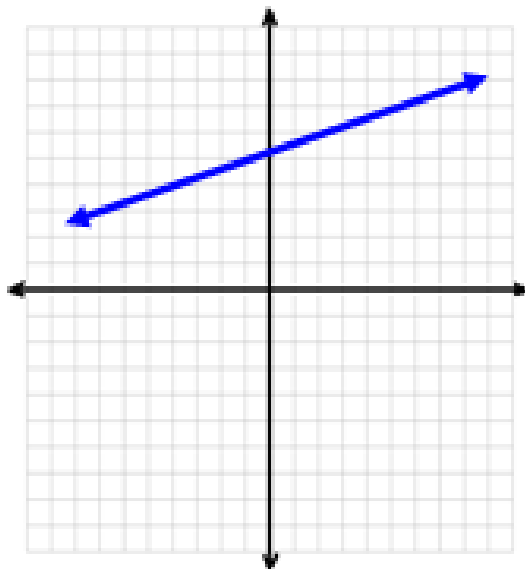
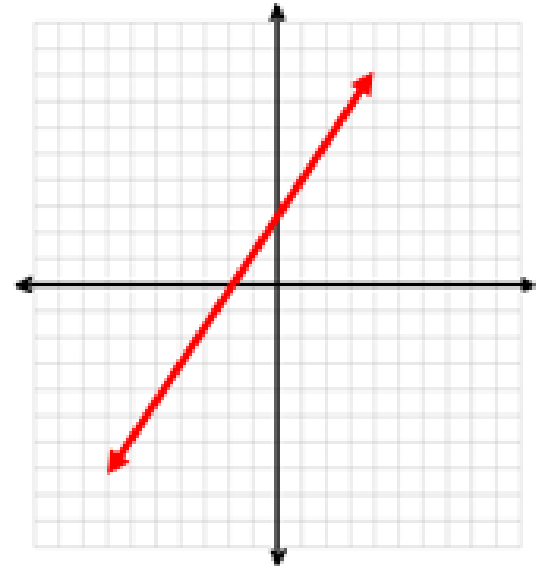
Find the Slope of the line.



Lesson 7: Section 2.3 & 2.4 - Slope Intercept Form

Positive Slope Graphs (Increasing or Rising)

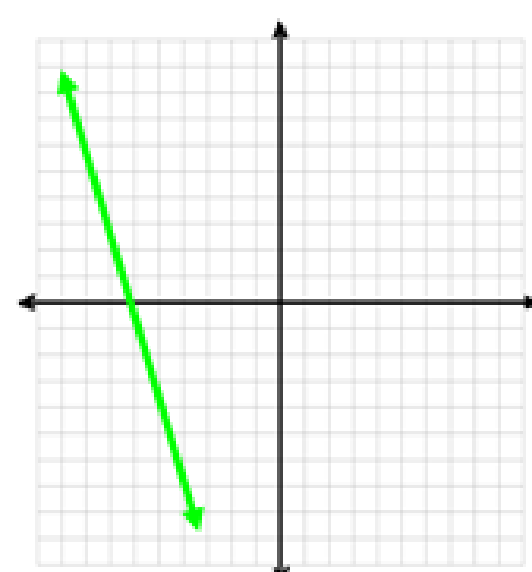
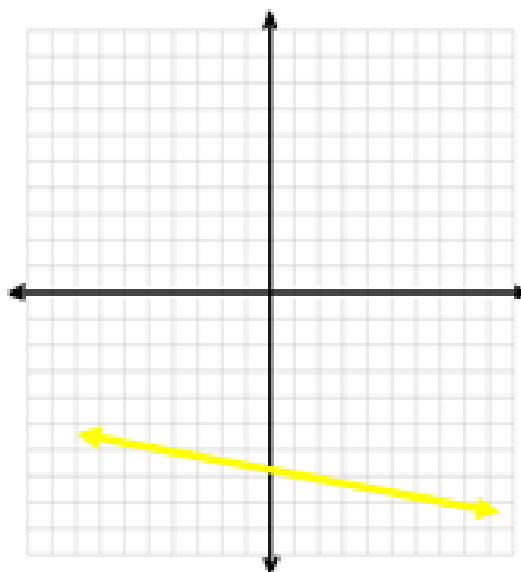
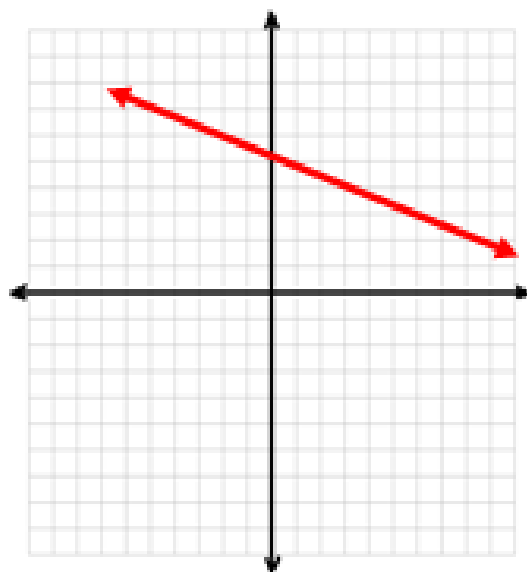
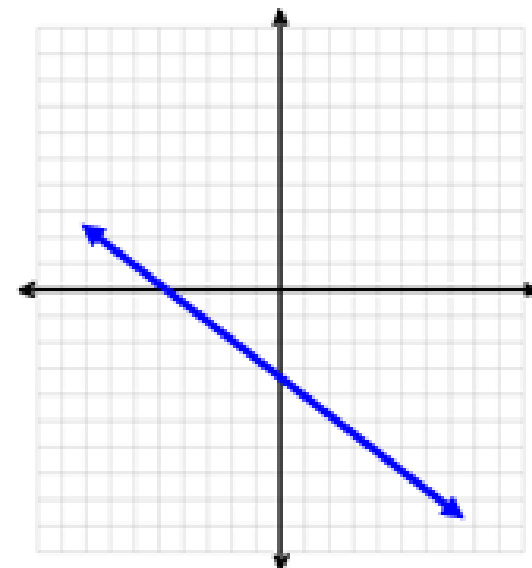
$$m > 0$$



Lesson 7: Section 2.3 & 2.4 - Slope Intercept Form

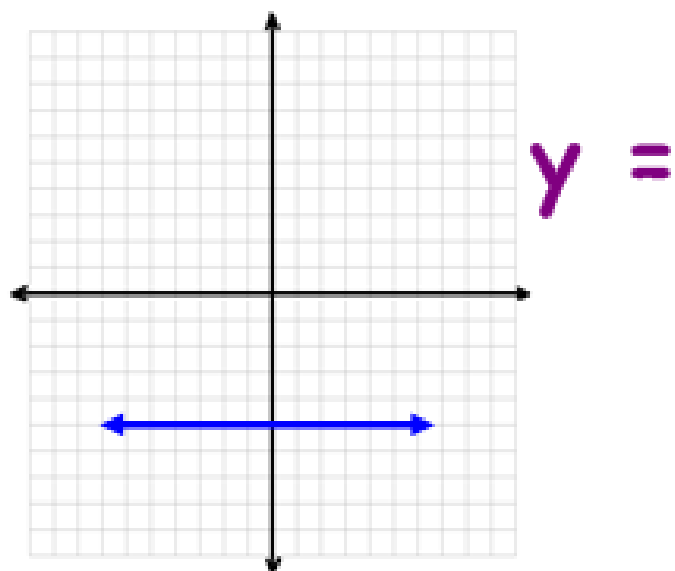
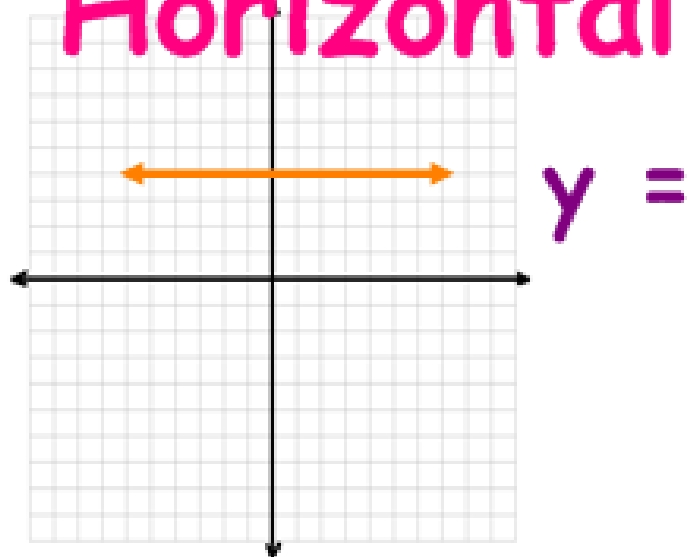
Negative Slope Graphs (Decreasing or Falling)

$$m < 0$$



Lesson 7: Section 2.3 & 2.4 - Slope Intercept Form

Slope=0 Graphs **Horizontal**



v

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r

t

i

c

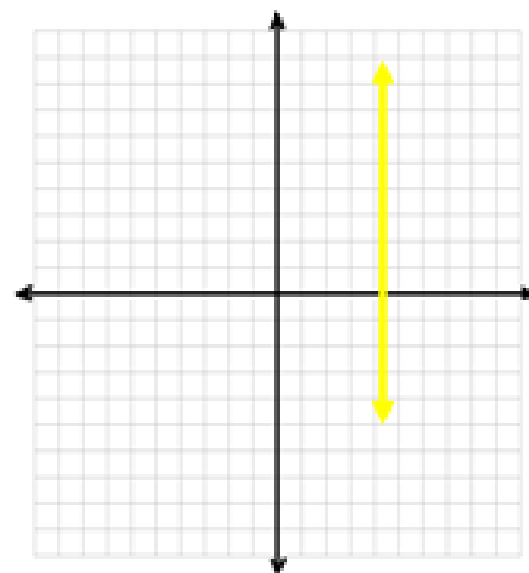
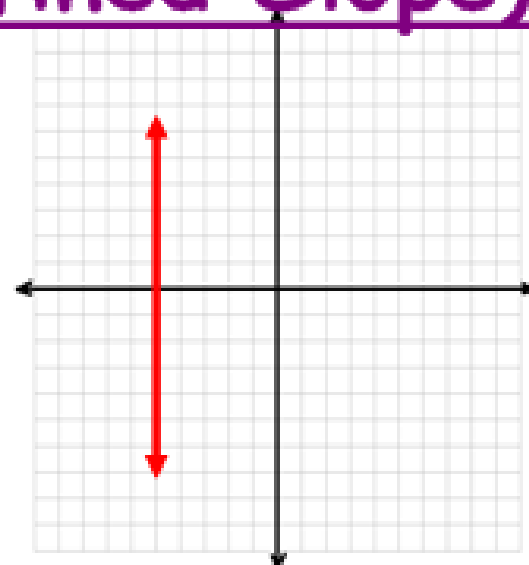
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$x =$

$x =$

No Slope Graphs (Undefined Slope)



Lesson 6: Section 2.2 & 2.3

Example 1:

Find the Slope of the line that passes through the points $(3,4)$ and $(6, -8)$.

Lesson 6: Section 2.2 & 2.3

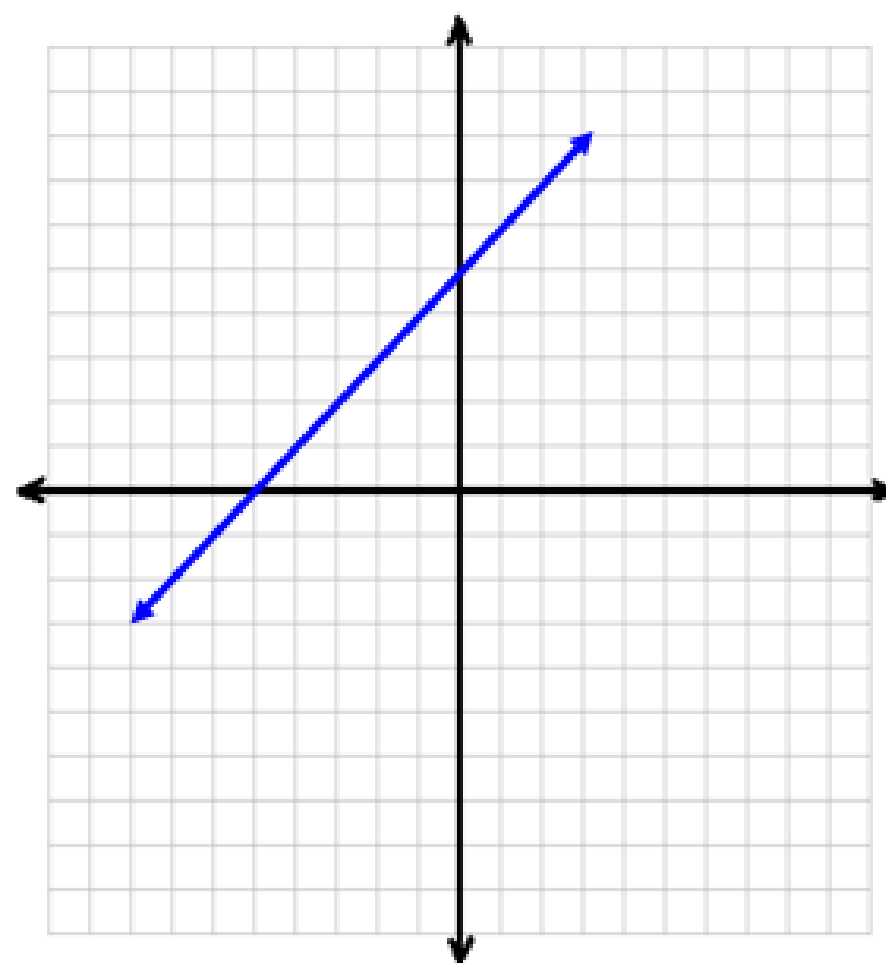
Example 2:

Find the intercept points.

(Where the graph crosses each axis.)

x- intercept: (,)

y- intercept: (,)



But how do we find the intercept point without a picture?

- When looking for the **y-intercept**, plug a zero in for X and solve for Y.
- When looking for the **x-intercept**, plug a zero in for Y and solve for X.

Example 3:

Find the x-int and y-int of $2x + y = 6$
and graph.

x-intercept:

- Plug in a zero for y
- Solve for x

y-intercept:

- Plug in a zero for x
- Solve for y



Lesson 6: Section 2.2 & 2.3

Example 3 continued:

Find the x-int and y-int of $2x + y = 6$
and graph.

Lesson 6: Section 2.2 & 2.3

Example 4:

Find the x-int and y-int of $x = 4$
and graph.

Example 5:

Find the x-int and y-int of $3x + 4 = 7y$
and graph.

x-intercept:

- Plug in a zero for y
- Solve for x

y-intercept:

- Plug in a zero for x
- Solve for y

Lesson 6: Section 2.2 & 2.3

Example 5 continued:

Find the x-int and y-int of $3x + 4 = 7y$
and graph.

Lesson 6: Section 2.2 & 2.3

Example 6:

Find the x-int and y-int of $y = -3$
and graph.

Can the point of interception on the x-axis and the point of interception on the y-axis ever be the same point?

Lesson 6: Section 2.2 & 2.3

- When we only have one point $(0,0)$, we need to pick another X and plug it into the equation to find Y . We now have another point to plot and can connect the points to make a line.

Lesson 6: Section 2.2 & 2.3

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Can you?

Lesson 6: Section 2.2 & 2.3

Homework:

Assignment 6