

Chapter 5 Student Success Sheet (SSS)

Graphing and Writing Equations of Lines Olathe East High School – Intermediate Algebra

Name: _____

Hour: _____

Reminders:

- Homework is completed in **homework notebook only**.
- **All pages** in homework notebook should be labeled accordingly:
Unit _____ Concept _____ - (title of assignment)

Need Help? Support is available!

- www.mhollan.weebly.com
- www.srushingoe.weebly.com

“Success is not final;
failure is not fatal. It
is the courage to
continue that
counts.”

Concept #	What we will be learning...	Mandatory Practice
1	Graph with a table by plugging in points	Practice Quiz 1
2	Verify that a point “lies on a line” or is a “solution to the equation”	Practice Quiz 2
3	Identify parts of a line (slope and y-intercept) and put it into slope-intercept form; then write the equation of a line given slope and y-intercept	Practice Quiz 3
4	Write equation AND graph a line given point and slope (teach algebraically and on a graph)	Practice Quiz 4
5	Write equation AND graph a line given two points (teach algebraically and on a graph)	Practice Quiz 5
6	Graph lines given slope-intercept form equation	Practice Quiz 6
7	Find x- and y-intercepts of a line when given in standard form	Practice Quiz 7
8	Graph lines when given standard form equation	Practice Quiz 8
9	Graph horizontal and vertical lines	Practice Quiz 9
10	Convert from slope-intercept form to standard form (vice versa)	Practice Quiz 10

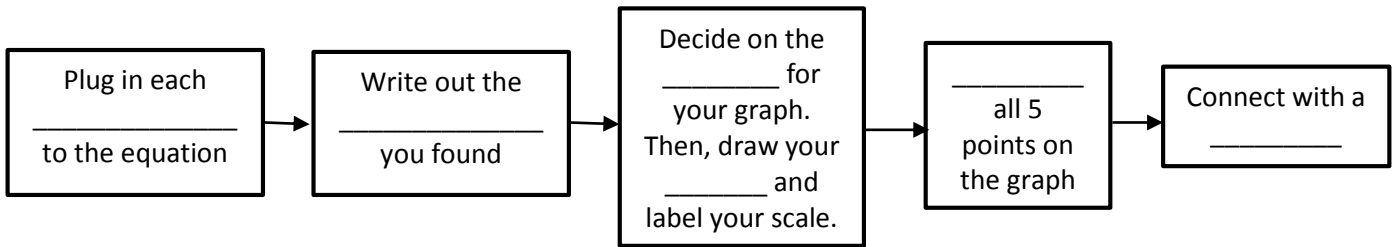
#1 Graph with a table by plugging in points

A L_____ always has a C_____ R_____ of C_____ (or S_____).

This means that all the points on the line can connect with a S_____ Ruler!

One way we can graph is by making an **X-Y Table**.

This is also known as an I_____ - O_____ Table or a _____

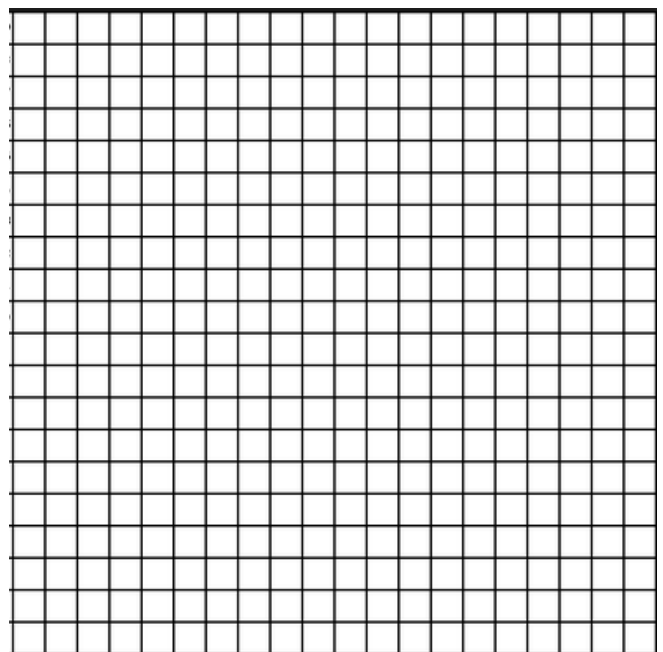
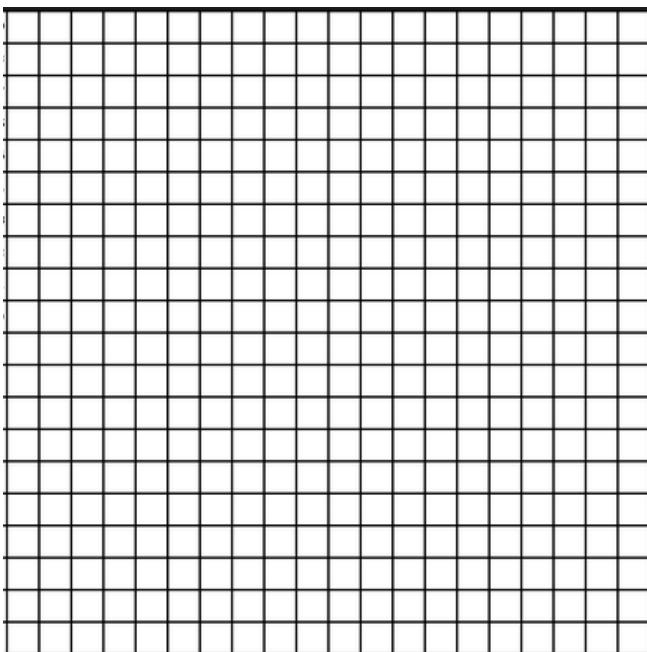


1. $y = -3x + 4$

x	Plug in	y	Ordered Pair
-2			
-1			
0			
1			
2			

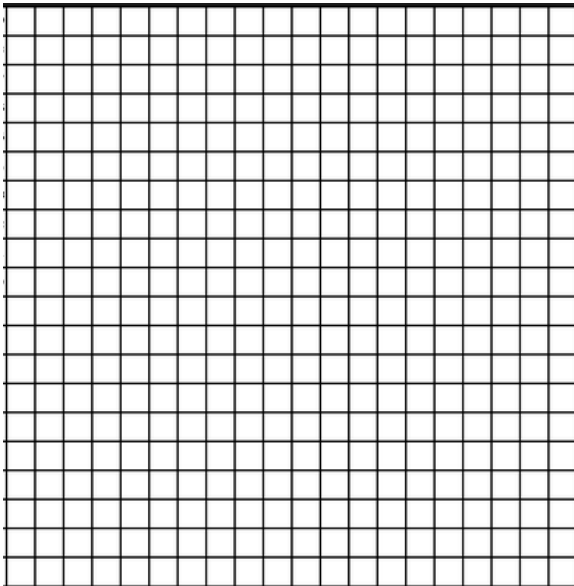
2. $y = -2x - 5$

x	Plug in	y	Ordered Pair
-2			
-1			
0			
1			
2			



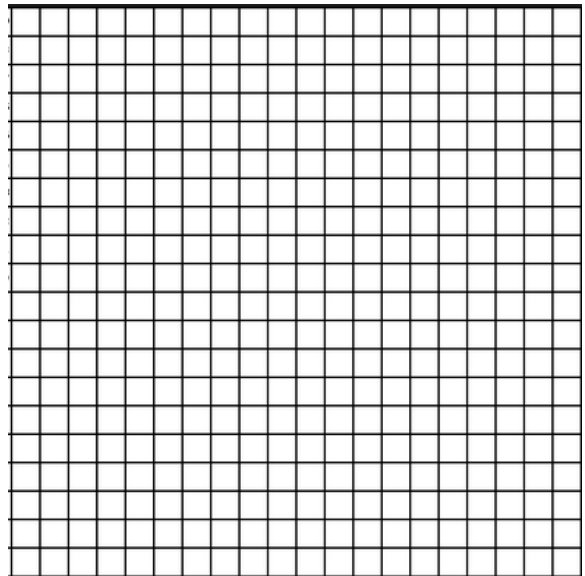
3. $y = x + 3$

x	Plug in	y	Ordered Pair
-2			
-1			
0			
1			
2			



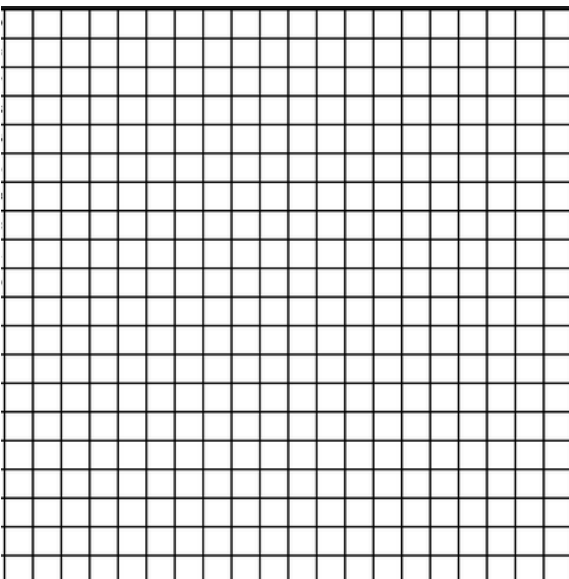
4. $y = -x + 1$

x	Plug in	y	Ordered Pair
-2			
-1			
0			
1			
2			



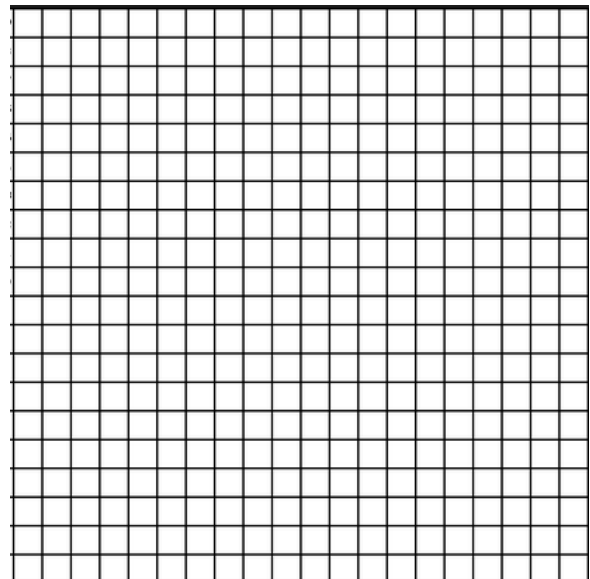
5. $y = -4x + 4$

x	Plug in	y	Ordered Pair
-2			
-1			
0			
1			
2			



6. $y = 5x - 3$

x	Plug in	y	Ordered Pair
-2			
-1			
0			
1			
2			



#2 Verifying that a point “lies on a line” or is a “solution to the equation”

<p>Determine if the point lies on the line.</p> <p>Point: $(-15, 5)$</p> <p>Line: $y = -\frac{1}{5}x + 2$</p> $5 = -\frac{1}{5}(-15) + 2$ $5 = 3 + 2$ $5 = 5$ <p>Step 1: Substitute in the values of x and y.</p> <p>Step 2: Evaluate.</p> <p>Step 3: If the values given make a valid equation, then the point lies on the line.</p> <p>Step 3: If the values given make a valid equation, then the point lies on the line.</p> <p>If the final step is not true such as $2=3$ then it does NOT lie on the line.</p>	<p>If you plug in an O _____ P _____</p> <p>and end of with a _____ statement,</p> <p>That means the given point</p> <p>“L_____ O_____ T_____ L_____”</p> <p>if you were to graph it!</p>
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- Which point lies on the line represented by the equation $2x + 3y = -6$?
 - (2, -2)
 - (-1, 2)
 - (0, 2)
 - (-3, 0)
- $(-1, -1)$; $y = -2x - 3$
- $(-2, 5)$; $y = 3x + 1$
- $(6, -3)$; $-x - 7y = 13$
- $(-1, -3)$; $-6x + 3y = -4$
- $(-2, 0)$; $4y = -8x + 3$
- $(8, 13)$; $y = \frac{3}{4}x + 7$
- $(3, -10)$; $y = -5x - 2$
- $(0, -4)$; $y = -\frac{1}{2}x + 2$
- $(9, 0.5)$; $x - 2y = 8$

Error Analysis: Find and correct the student's mistake in the work below.

Verify whether the point lies on the graph of the given line.

 $3.2y - 1.5x = 0.72$ $(4, 2.1)$ $3.2(2.1) - 1.5(4) = 0.72$ $6.72 - 1.5(4) = 0.72$ $5.22(4) = 0.72$ $20.88 \neq 0.72$ $(4, 2.1)$ is not a solution 	 $y = -0.25x + 2.2$ $(2.4, -0.8)$ $2.4 = -0.25(-0.8) + 2.2$ $2.4 = 0.2 + 2.2$ $2.4 = 2.4$ $(2.4, -0.8)$ is a solution
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#3 Identifying parts of a line (slope and y-intercept) and putting it into slope-intercept form

Write the equation of the line given the slope and y-intercept.

Equation	Slope-Intercept Form of a Linear Equation
	The slope-intercept form of a linear equation in $y = mx + b$ <div style="display: flex; justify-content: center; gap: 20px;"> <div style="text-align: center;"> \uparrow slope </div> <div style="text-align: center;"> \uparrow y-intercept </div> </div>

y-intercepts are always written as an ordered pair: (0,b)

9) Slope = $-\frac{2}{5}$, y-intercept = 4

10) Slope = -3 , y-intercept = 5

11) Slope = $\frac{3}{5}$, y-intercept = 1

12) Slope = $\frac{3}{2}$, y-intercept = -2

13) Slope = $-\frac{7}{3}$, y-intercept = -4

14) Slope = 2, y-intercept = 1

15) Slope = $\frac{3}{5}$, y-intercept = -1

16) Slope = 9, y-intercept = 5

17) Slope = $-\frac{1}{5}$, y-intercept = -5

18) Slope = $-\frac{8}{3}$, y-intercept = -2

	#19	y-intercept
	slope	
	equation	

	#20	y-intercept
	slope	
	equation	

	#21	y-intercept
	slope	
	equation	

	#22	y-intercept
	slope	
	equation	

	#23	y-intercept
	slope	
	equation	

	#24	y-intercept
	slope	
	equation	

SLOPE-INTERCEPT FORM IS $y = \underline{\hspace{1cm}}x + \underline{\hspace{1cm}}$, where $m = \underline{\hspace{1cm}}$ and $(0, b)$ is the $\underline{\hspace{1cm}}$.

Four types of lines: Uphill $\underline{\hspace{1cm}}$; Downhill $\underline{\hspace{1cm}}$; Horizontal $\underline{\hspace{1cm}}$; Vertical $\underline{\hspace{1cm}}$

#4 Write equation AND graph a line given point and slope (teach algebraically and on a graph)**Writing equations of Lines (slope intercept)**

Write the equation of a line
You'll use this formula every time!
 $y=mx+b!$

"m" is the slope, the rise over run
and "b" is the y-intercept, we're almost done
If they give you a point, an "x" and a "y",
just plug the numbers in, solve for "b" and say bye!

To write the equation of a line
You'll use this formula every time!
 $y = mx + b!$

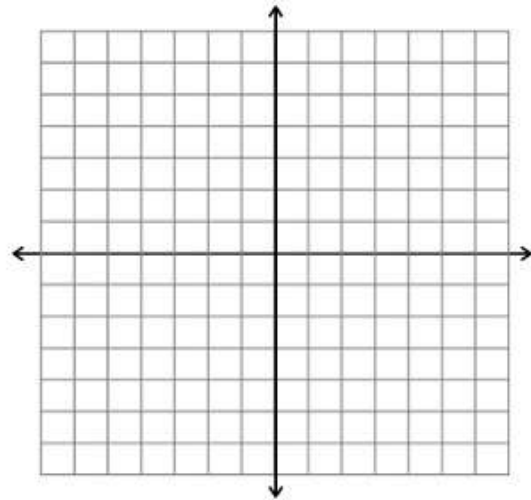
Given slope and one point

Steps:

1. Identify $m= \underline{\hspace{1cm}}$, $x= \underline{\hspace{1cm}}$, $y= \underline{\hspace{1cm}}$
2. Write out $y = mx + b$ like $\underline{\hspace{1cm}} = \underline{\hspace{1cm}} (\underline{\hspace{1cm}}) + b$
3. Plug in m, x, and y into the formula
4. Solve for b
5. Plug in m and b into your equation as your final answer.

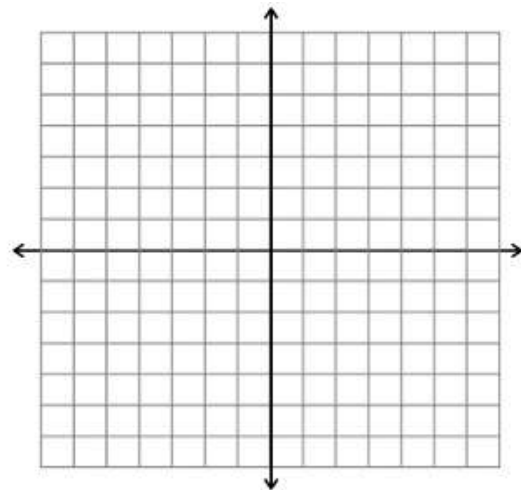
25) through $(-1, -2)$, slope = 4

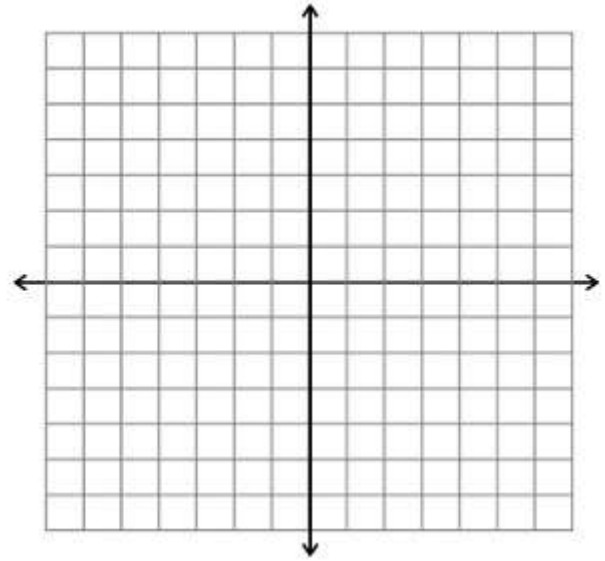
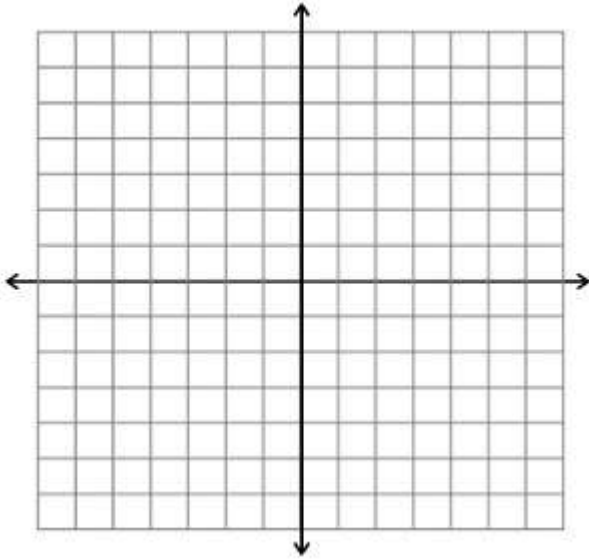
1. Identify $m= \underline{\hspace{1cm}}$, $x= \underline{\hspace{1cm}}$, $y= \underline{\hspace{1cm}}$
2. Write out $y=mx+b$ like $\underline{\hspace{1cm}} = \underline{\hspace{1cm}} (\underline{\hspace{1cm}}) + b$
3. Plug in m, x, and y into the formula
4. Solve for b
5. Plug in m and b into your equation as your final answer.



26) through $(-5, -3)$, slope = 1

1. Identify $m= \underline{\hspace{1cm}}$, $x= \underline{\hspace{1cm}}$, $y= \underline{\hspace{1cm}}$
2. Write out $y=mx+b$ like $\underline{\hspace{1cm}} = \underline{\hspace{1cm}} (\underline{\hspace{1cm}}) + b$
3. Plug in m, x, and y into the formula
4. Solve for b
5. Plug in m and b into your equation as your final answer.



27) through $(-2, -5)$, slope = $\frac{3}{2}$ 28) through $(-5, -2)$, slope = $\frac{7}{5}$ 

#5 Write equation AND graph a line given two points (teach algebraically and on a graph)

Given two points

Steps:

1. Use the slope formula to find m

$$\frac{(\quad) - (\quad)}{(\quad) - (\quad)} =$$

2. Identify $m = \underline{\quad}$, $x = \underline{\quad}$, $y = \underline{\quad}$

***Use either of these points to pick x and y!**

3. Write out $y = mx + b$ like $\underline{\quad} = \underline{\quad}(\underline{\quad}) + b$
4. Plug in m, x, and y into the formula
5. Solve for b
6. Plug in m and b into your equation as your final answer.

29) through: $(4,0)$ and $(3,3)$

Steps:

1. Use the slope formula to find m

$$\frac{(\quad) - (\quad)}{(\quad) - (\quad)} =$$

2. Identify $m = \underline{\quad}$, $x = \underline{\quad}$, $y = \underline{\quad}$
3. Write out $y = mx + b$ like $\underline{\quad} = \underline{\quad}(\underline{\quad}) + b$
4. Plug in m, x, and y into the formula
5. Solve for b
6. Plug in m and b into your equation as your final answer.

30) through: $(-3,1)$ and $(-4,-1)$

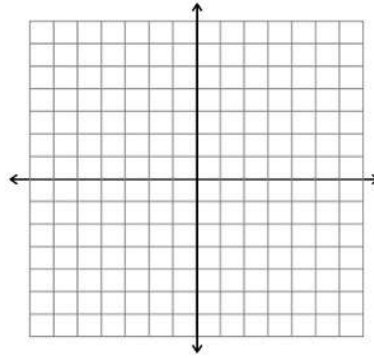
Steps:

1. Rise = $\underline{\quad}$
Run = $\underline{\quad}$
Slope = $\underline{\quad}$
2. y-intercept = $\underline{\quad}$
3. Equation: $\underline{\hspace{2cm}}$

31) through: (4,2) and (0,-1)

$$\frac{\left(\quad \right) - \left(\quad \right)}{\left(\quad \right) - \left(\quad \right)} =$$

32) through: (-1,0) and (3,5)



33) through: (4,2) and (0,-1)

Steps:

1. Use the slope formula to find m

$$\frac{\left(\quad \right) - \left(\quad \right)}{\left(\quad \right) - \left(\quad \right)} =$$

2. Identify m= ____, x= ____, y= ____

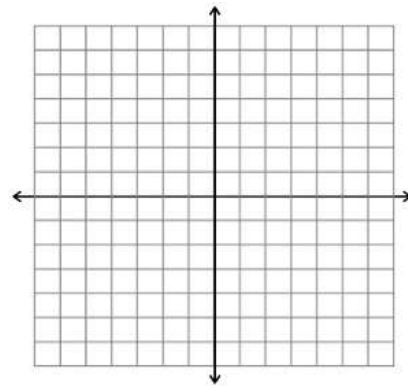
3. Write out y=mx+b like ____ = ____ (____) + b

4. Plug in m, x, and y into the formula

5. Solve for b

6. Plug in m and b into your equation as your final answer.

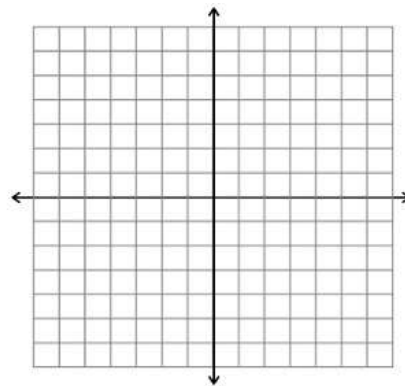
34) through: (-1,0) and (3,5)



35) through: (-4,-2) and (-5,-5)

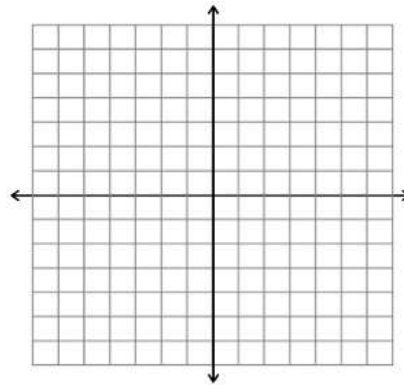
$$\frac{\left(\quad \right) - \left(\quad \right)}{\left(\quad \right) - \left(\quad \right)} =$$

36) through: (3,3) and (2,-4)



37) through: (4,1) and (0,3)

38) through: (2,0) and (-3,-3)



#6 Graphing lines given slope-intercept form equation

1. Identify the _____ and the _____.
2. Plot the y-intercept on the _____
3. Identify the _____ and the _____
4. Count _____ for the rise and _____ for the run
5. Connect the two points with a ruler! Put _____ on both ends!

Example: Graph $y = 2x$

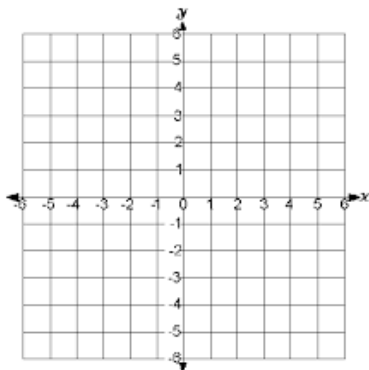
<p>Step 1 The y-intercept is 0. So plot a point at (0,0).</p>	<p>Step 2 The slope is 2, or $\frac{2}{1}$. Use the slope to plot a second point.</p>	<p>Step 3 Draw a line through the two points.</p>

37) $y = -\frac{5}{2}x - 5$

Slope = _____

38) $y = 2x - 5$

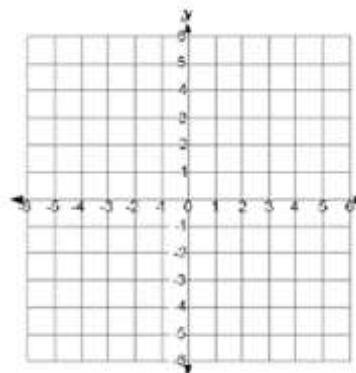
Slope = _____



rise = _____ run = _____

y-intercept = _____

What type of line:

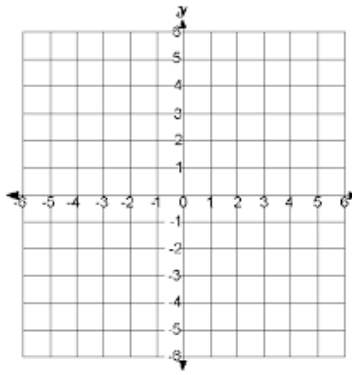


rise = _____ run = _____

y-intercept = _____

What type of line:

39) $y = \frac{1}{4}x - 4$



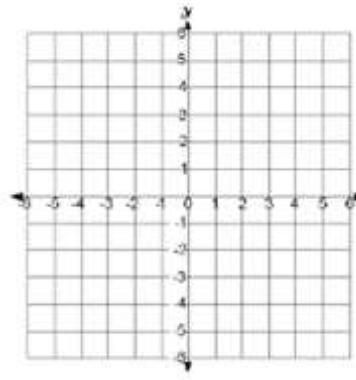
Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

40) $y = -\frac{3}{5}x + 1$



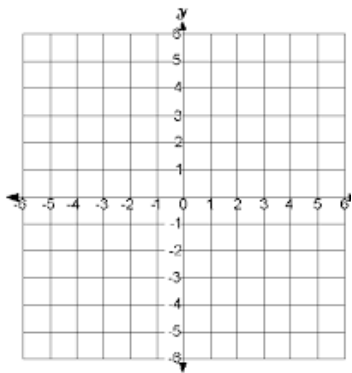
Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

41) $y = \frac{1}{3}x$



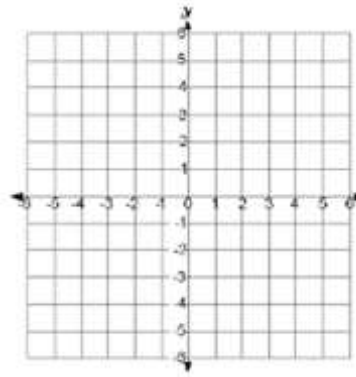
Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

42) $y = -x + 2$



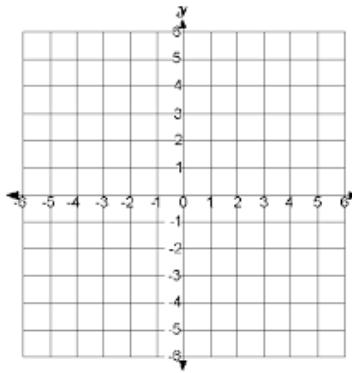
Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

43) $y = -\frac{3}{2}x - 1$



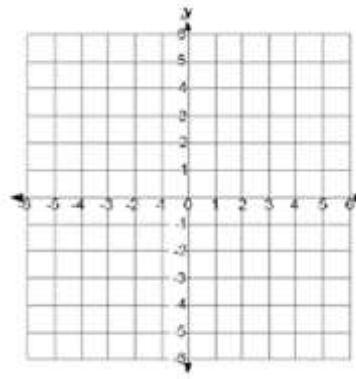
Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

44) $y = 2x + 4$



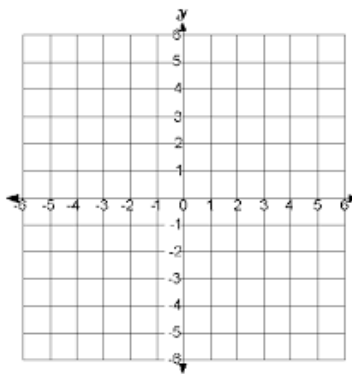
Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

45) $y = \frac{1}{2}x - 2$



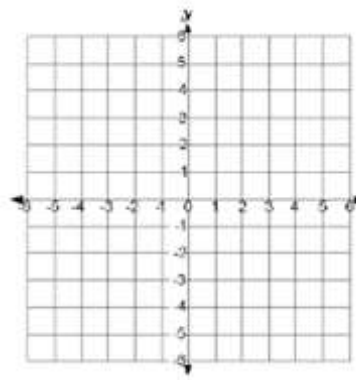
Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

46) $y = x + 3$



Slope = _____

rise = _____ run = _____

y-intercept = _____

What type of line:

#7 Finding x and y-intercepts of a line when given in standard form

Definition	Standard Form of a Linear Equation
The standard form of a linear equation is $Ax + By = C$, where A, B, and C are real numbers and A and B are not both zero.	

“Standard form” is when ___ and ___ on the _____!

To find the x-intercept: _____ It will be an ordered pair (____, 0)

To find the y-intercept: _____ It will be an ordered pair (0,____)

	<u>x-intercept</u>	<u>y-intercept</u>		<u>x-intercept</u>	<u>y-intercept</u>
47) $x + 4y = 16$			48) $x - 2y = -6$		
49) $x + 5y = -5$			50) $x - 4y = -4$		
51) $x + 4y = -12$			52) $x - 3y = 15$		
53) $x - 4y = 8$			54) $x + y = 1$		
55) $x - y = -3$			56) $3x - 5y = -15$		

#8 Graphing lines when given standard form equation

Graphing Lines (standard form)

x and y are on the same side

Use your hands to carefully hide

Cover the x → y-intercept!

Cover the y → x-intercept!

Plot the intercepts separately.

Connect the dots and you will see.

YOUR LINE!

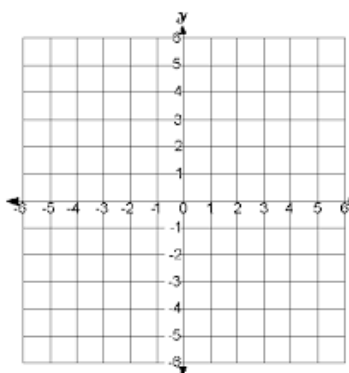
57) $x + y = -2$

x-intercept= _____

y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____



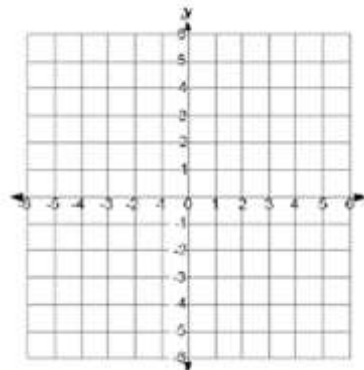
58) $2x - y = -4$

x-intercept= _____

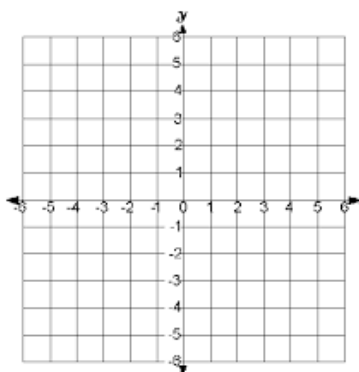
y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____



59) $2x + 3y = -6$



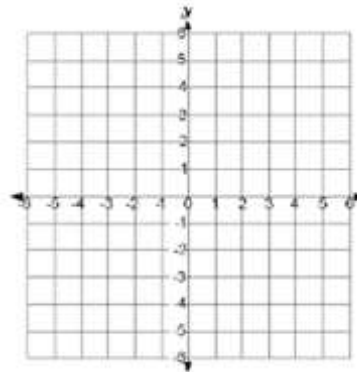
x-intercept= _____

y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____

60) $x - 2y = -2$



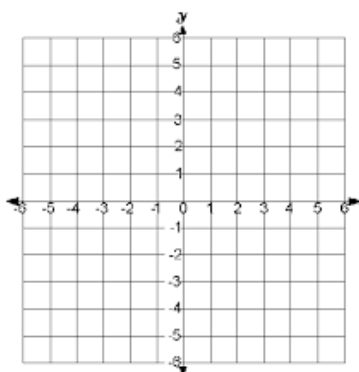
x-intercept= _____

y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____

61) $3x - y = 3$



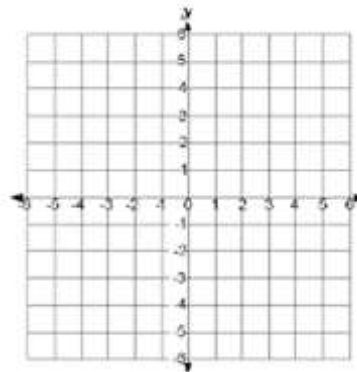
x-intercept= _____

y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____

62) $x - 5y = 5$



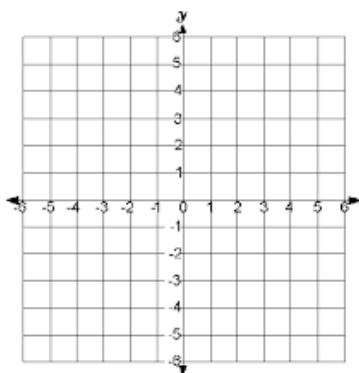
x-intercept= _____

y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____

63) $x - 2y = 2$



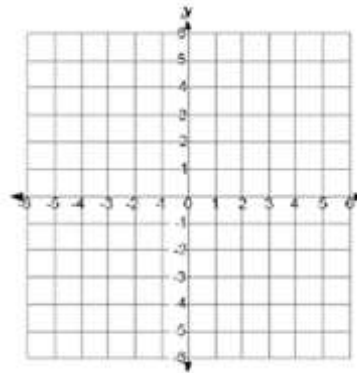
x-intercept= _____

y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____

64) $2x + y = -2$



x-intercept= _____

y-intercept= _____

Just for practice what is the slope? _____

What type of line: _____

#9 Graphing horizontal and vertical lines

A horizontal line has a slope of _____

The equation will always be _____

REMEMBER: _____

Graphing Lines (horizontal and vertical)

Horizontal → YE-AH (shout)

A vertical line has a slope of _____

The equation will always be _____

REMEMBER: _____

Vertical → x-ray vision (whisper)

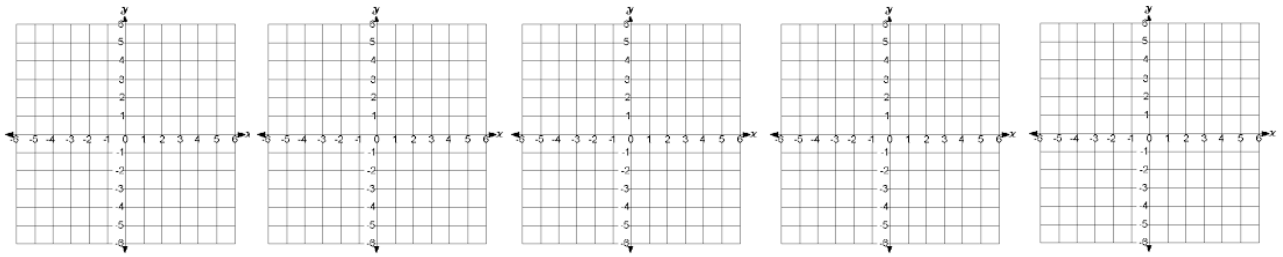
65) $x = 4$

67) $y = 1$

69) $x = -2$

71) $x = 3$

73) $y = 3$



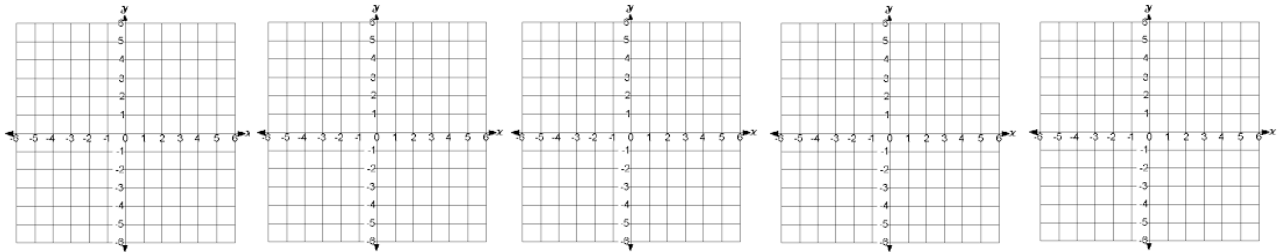
66) $x = -3$

68) $y = 5$

70) $x = 5$

72) $x = 1$

74) $y = 4$



#10 Converting From Slope-Intercept to Standard Form/Vice-versa

75) $9x - y = -1$

76) $2 + 3y = -15$

77) $5x - 6y = -36$

78) $3x - 2y = -6$

Subtract $9x$ from both sides

$$-y = -9x - 1$$

Divide by -1

$$y = 9x + 1$$

79) $y = \frac{7}{2}x - 4$

80) $y = -\frac{1}{2}x - 1$

81) $y = \frac{3}{2}x - 6$

82) $y = -\frac{2}{3}x - 4$

Get rid of the fraction by multiplying everything by the denominator

$$2y = 7x - 8$$

Get x and y on the same side

$$2y - 7x = -8$$

Make sure it's in the right order

$$-7x + 2y = -8$$