SLOPE – INTERCEPT FORM, STANDARD FORM, AND DOMAIN & RANGE

Example: If a line goes through the point (0, 5) and has a slope of 2, write the equation of the line in point – slope form.

Example: Using your answer to the last example, write y as a function of x and simplify completely.

Example: What do you notice about the function you have just written?

Slope – Intercept Form

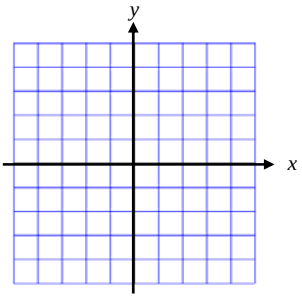
The slope intercept form of a linear equation is _____ .

where m = _____, and b = _____
(Note: Your book uses the letter a instead of m because that's what your calculator uses ...
It's just a symbol … you could write the equation as y = ☺x + ♥)

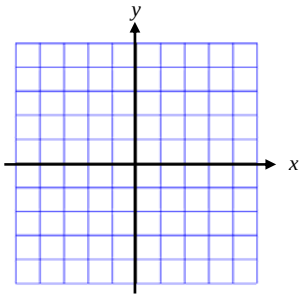
Example: If the y – intercept of a line is –7, and the slope is 12, write the equation of the line in slope – intercept form.

Example: Graph the following equations on the graphs provided.

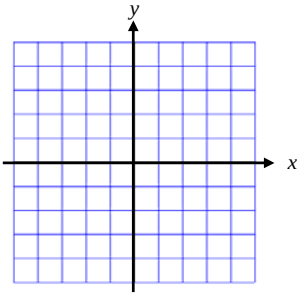
a) $y = \frac{3}{4}x - 4$



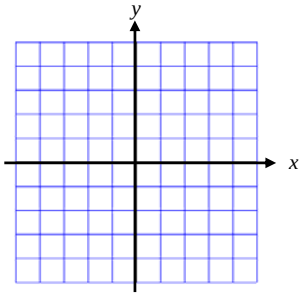
b) $y = -\frac{2}{3}x + 1$



c) $y = 2x$



d) $y = \frac{1}{2}x + \frac{3}{2}$



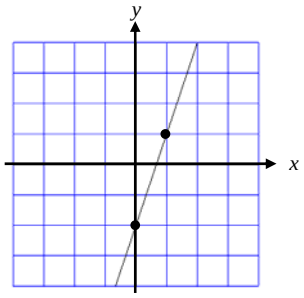
Example: For each of the following, write the equation of the line with the given information in slope – intercept form.

a) Point (–4, 6); Slope = –1

b) Point (2, 2); y – intercept = 10

c) Points (12, 0) and (6, 3) are on the line.

d)



More with Slope

The two charts below illustrate two lines that we have not discussed thus far.

	HORIZONTAL Lines	VERTICAL Lines
Picture		
Slope		
Equation of Line		

Example: Using the point (3, –2), write the equation of the line that

a) passes through the point and has a slope of 0.

b) passes through the point and has no slope.

Standard Form of a Linear Equation

When all the variables in an equation are on the LEFT side, and all the constants are on the RIGHT side, an equation is in standard form. For a linear equation, this looks like

where the coefficients *A*, *B*, and *C* are _____.

When you need to write an equation in standard form you should start in one of the other two forms, then rewrite it.

Example: Rewrite the following equations in Standard Form:

a) $y = \frac{2}{3}x + 5$

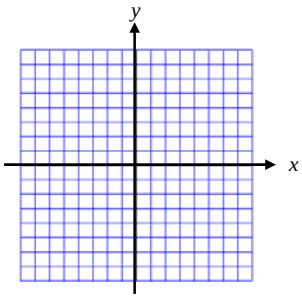
b) $y - 4 = -\frac{1}{2}(x + 2)$

Example: At this point, we have covered 5 types of linear equations:

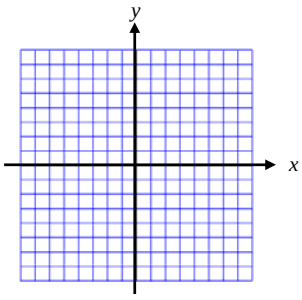
Horizontal Line
Point – Slope Form
Slope – Intercept Form
Standard Form
Vertical Line

Identify which form each equation below is in and graph each linear equation on the graph paper provided.

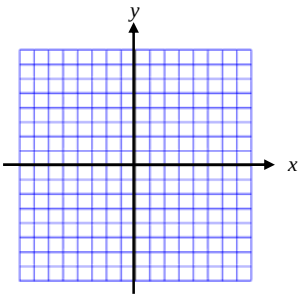
a) $y - 2 = 3(x - 1)$



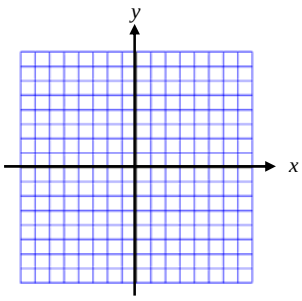
b) $y = 3x + 4$



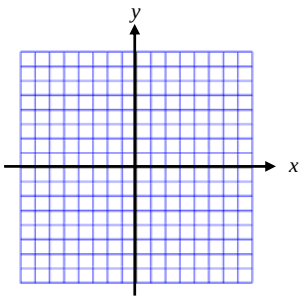
c) $2x + 3y = 6$



d) $y = 7$



e) $x = -2$



Domain and Range (Also known as the Independent and Dependent Variables)

When you first learned to graph lines, you made an INPUT/OUTPUT table. The input you used for _____, and the output was _____.

The Domain of a function is just another word for the INPUT. The **domain** is all the possible values of x you are allowed to use. For now, many of the functions we will use have a domain that is the set of all real numbers, or _____ for short. You should determine whether or not there are some numbers that can be eliminated from the domain of a function.

The domain of a function can be restricted by …

1. Explicitly limiting the domain by stating the domain in the problem.

   Example: Consider $y = 2x - 4$ if $x \leq 2$. What is the domain?

2. The context of a problem.

   Example: You need to complete a project and are trying to determine the total cost. You have $2000 in startup costs, and have promised each person you hire $50 for their help.

   a) Write an equation that models your total cost as a function of the number of people you hire.

   b) What would the domain of this function be?

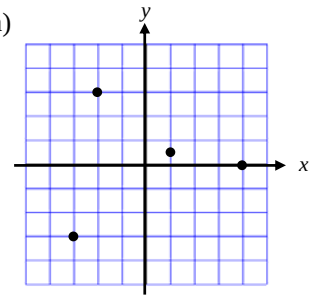
3. The function itself.

   Example: Consider $y = \sqrt{x}$. What is the domain?

The **range** of a function then is all the possible _____ you obtain when using all the numbers in the domain. Many times the range is easier to find using a graph.

Example: Find the domain and range of each graph below.

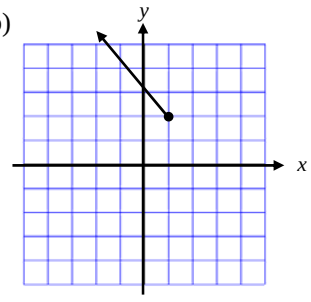
a)



Domain: _____

Range: _____

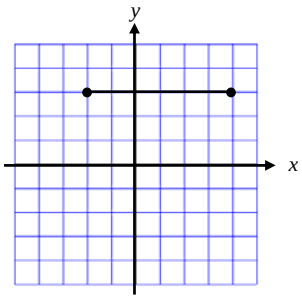
b)



Domain: _____

Range: _____

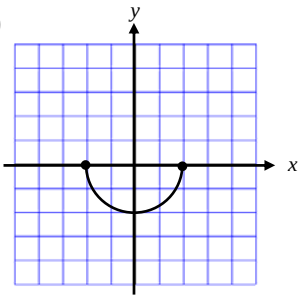
c)



Domain: _____

Range: _____

d)



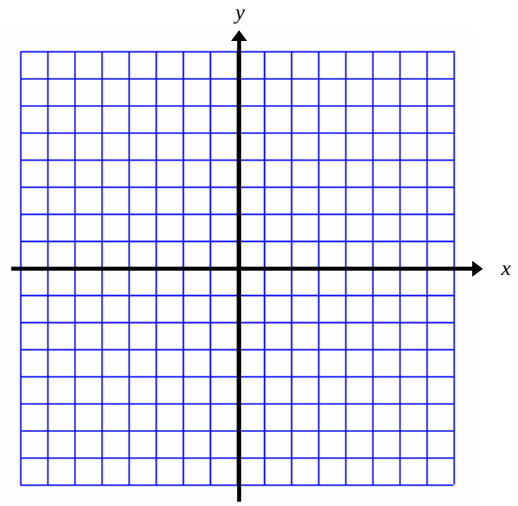
Domain: _____

Range: _____

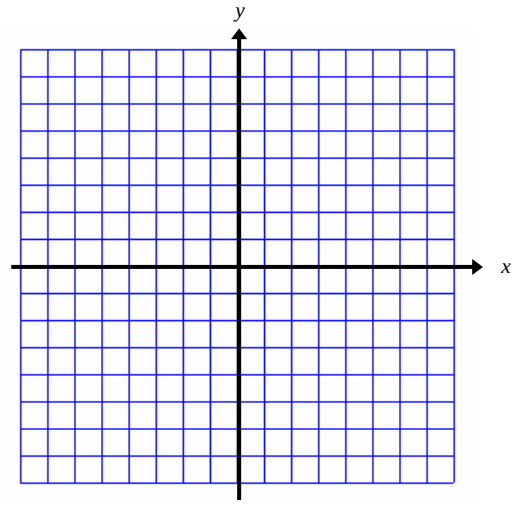
Now that you've done these, can you go back and find the range of the three examples we used above?

Example: Graph each of the following linear equations. State the Domain and Range.

a) $h(x) = 2x - 5$ if $x < -1$.



b) $y = -\frac{2}{3}x + 4$ if $x > 2$.



c) $y - 2 = \frac{1}{4}(x - 1)$ if $x \leq 4$.