

Name _____

Date _____

Reporting Category 4 Notes (A.7.B.)

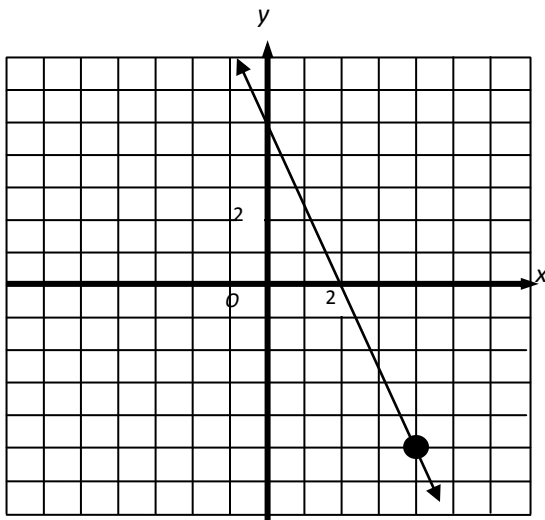
In every linear function there is an input value (x) and an output value (y). If given either the x or the y value, you can always find the other value.

Example: Given the function $5x + 2y = 10$, find the x if the value of y is -5 .

$$\begin{array}{r} 5x + 2(-5) = 10 \\ 5x - 10 = 10 \\ + 10 \quad +10 \\ \hline 5x = 20 \\ x = 4 \end{array}$$

So when $y = -5$, $x = 4$. The point $(4, -5)$ is a solution.

A solution to a linear equation is *any* point that is on the line. Therefore in the example above if we graphed the equation $5x + 2y = 10$, we would find the point $(4, -5)$ falls on the line of graph.



We could also identify other solutions just by looking at the graph. Other possible solutions for this function include $(2, 0)$ and $(0, 5)$.

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Linear Inequalities

An linear inequality is similar to a linear equation but will have an inequality sign rather than an equal sign.

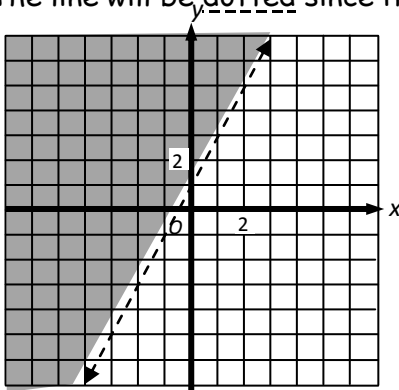
Inequality Signs:

$<$	\leq	$>$	\geq
<ul style="list-style-type: none"> • <u>less than</u> • fewer than 	<ul style="list-style-type: none"> • <u>less than or equal to</u> • no more than • at most 	<ul style="list-style-type: none"> • <u>greater than</u> • more than 	<ul style="list-style-type: none"> • <u>greater than or equal to</u> • no less than • at least

When graphing linear equations the sign determines two parts of the graph - The shading and if the line will be a solid line or a dotted line. Below are examples of each type of graph.

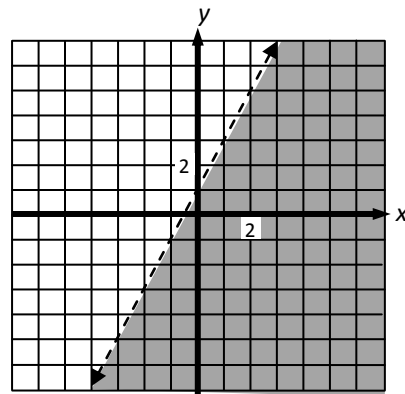
$$y > 2x + 1$$

The greater than sign means to shade *above*. The line will be dotted since it is not equal to.



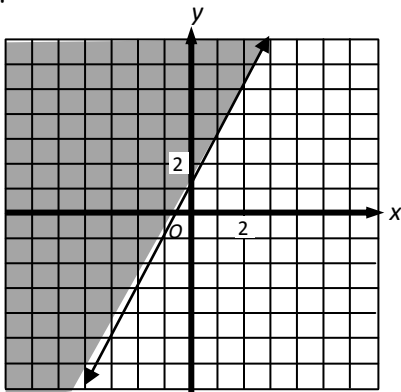
$$y < 2x + 1$$

The less than sign means to shade *below*. The line will be dotted since it is not equal to.



$$y \geq 2x + 1$$

The greater than or equal to sign means to shade *above*. The line will be solid since it is equal to.



$$y \leq 2x + 1$$

The less than or equal to sign means to shade *below*. The line will be solid since it is equal to.

