Name _____   Date _____
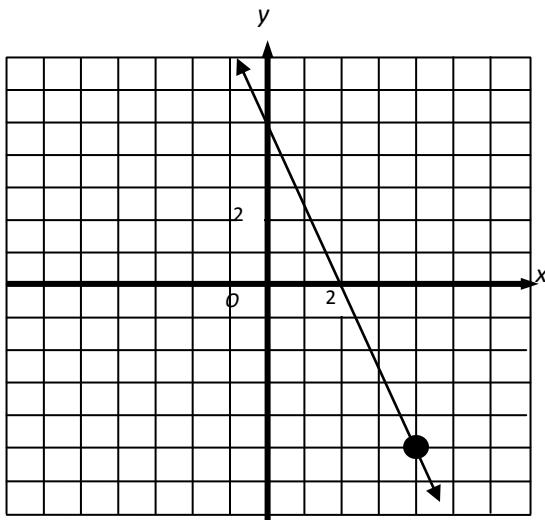
Reporting Category 4 Notes (A.7.B.)

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.

$$5x + 2(-5) = 10$$

$$5x \ -10 \ = 10$$

$$\underline{\quad +10 \quad | \quad +10 \quad}$$

$$5x \quad | = 20$$

| x = 4 |

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).

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

Linear Inequalities

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

Inequality Signs:

$<$	$\leq$	$>$	$\geq$
• less than • fewer than	• less than or equal to • no more than • at most	• greater than • more than	• greater than or equal to • 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.
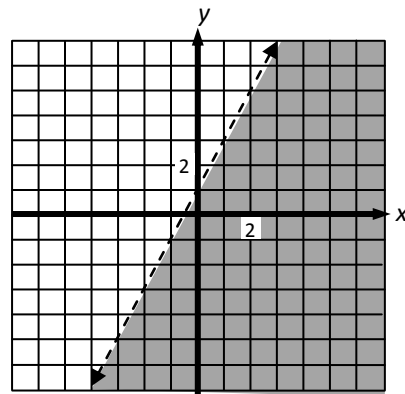
y > 2x + 1

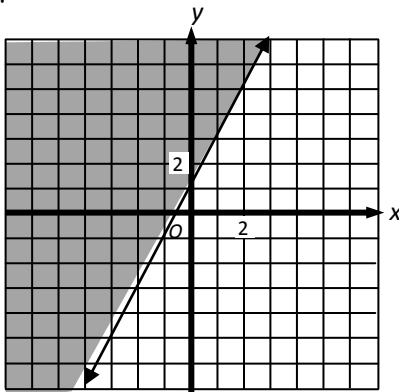The greater than sign means to shade *above*. The line will be dotted since it is not equal to.
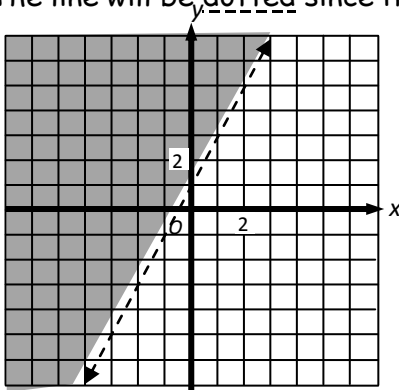
y < 2x + 1

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

y ≥ 2x + 1

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

y ≤ 2x + 1

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