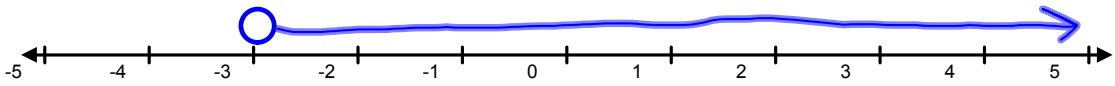
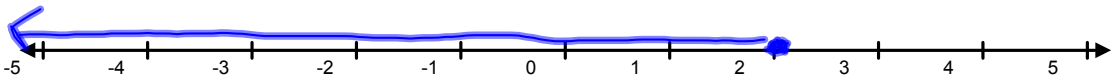
WARM UP:

Graph the following inequalities on a number line

a. $x > -3$



b. $x \leq 2$



Learning Target: I can graph linear inequalities.

1.1B Graphing Linear Inequalities

p.5

Section 1.1B

We use **inequalities** when there is a range of possible answers for a situation. "Larry can only work 24 or fewer hours each week", "This team needs to score at least one goal to have a chance of winning," and "To get a B this trimester I need more than 45 points on the final exam" are all examples of situations where a restriction or **constraint** is specified, but a range of possibilities exists within that constraint. In this section we will be investigating representations of inequalities.

One Variable Inequalities

1) You explored the possibilities of inequalities using a **number line** in past math courses.

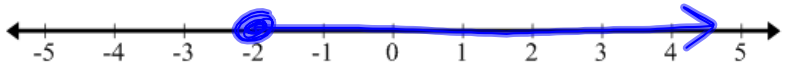
a) List values of x that make the inequality $x \geq -2$ true:

$0 \geq -2$

Can x equal −2 exactly?

0, 1, 2, −1, −2

b) On a **number line**, graph the values you listed and all values that make the inequality $x \geq -2$ true.



Let's look now at another representation of the same inequality $x \geq -2$, but this time on a **coordinate plane**.

2) Investigate the **solution region** of the inequality $y < -4$.

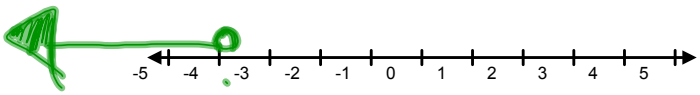
a) List values of y that make the inequality $y < -4$ true:

$-5 < -4$ true!

Can y equal −4 exactly? NO

−5, −8, −6

b) On a **number line**, graph the values you listed and all values that make the inequality $y < -4$ true.



Let's look now at another representation of the same inequality $y < -4$, but this time on a **coordinate plane**.

4) Describe how to graph the inequality $y < 4$ on a coordinate plane.

dashed line! SPECIAL CASE! horizontal line

5) When graphing on a **coordinate plane**, describe *when* and *why* a <u>dashed line</u> should be used in graphing a linear inequality and *when* and *why* a <u>solid line</u> should be used.

A <u>dashed line</u> is used when < or > NOT!

A <u>dashed line</u> is used because it can be exactly equal to the given value

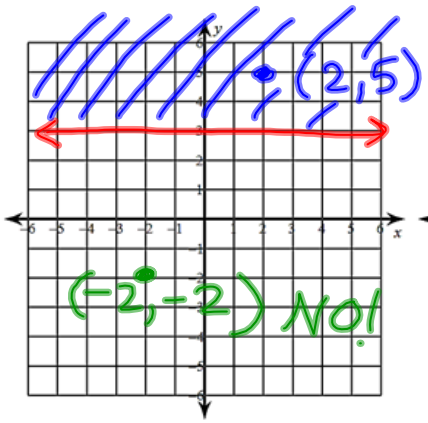
A <u>solid line</u> is used when ≤ or ≥

A <u>solid line</u> is used because it can be exactly equal to the given value

3) Graph each of the following, think of what values you would include in a table of values for each:

Special case vertical

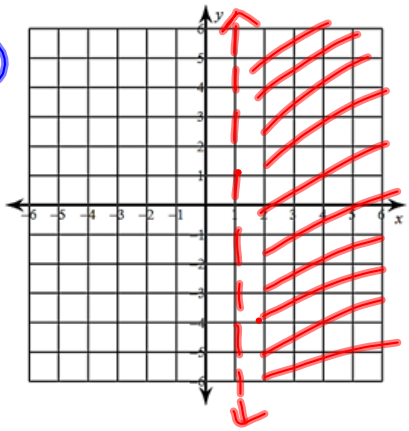
a) $y \geq 3$



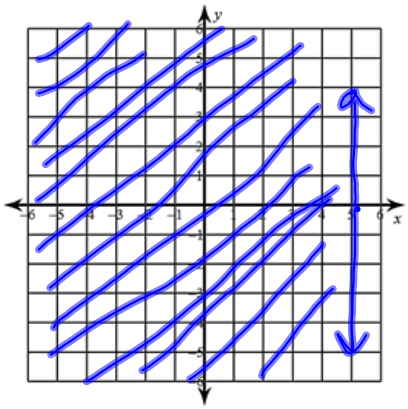
-2 ≥ 3

5 ≥ 3

b) $x > 1$

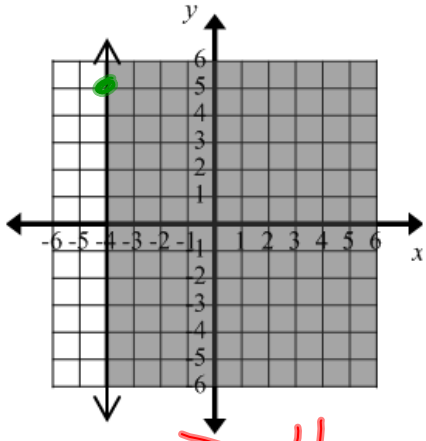


c) $x \leq 5$



HW: #1-6 (p-5)

6) Write the inequality for each of the following graphs:



Points on the boundary line

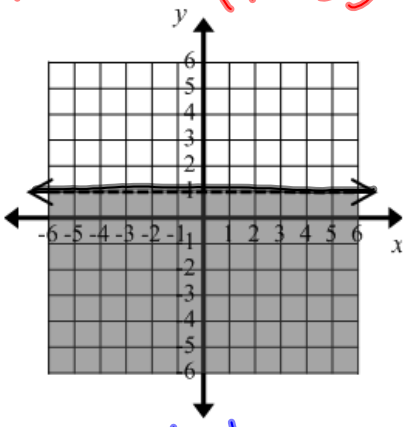
x	y
-4	5
-4	0
-4	1
-4	2

6a) $x \geq -4$

↑ because it's a vertical line

Points on the boundary line

x	y
-6	1
-2	1
0	1
1	1



6b) $y \leq 1$

b/c it's horiz.