Learning Target: I can graph linear inequalities.

# *1.1B Graphing Linear Inequalities*

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.

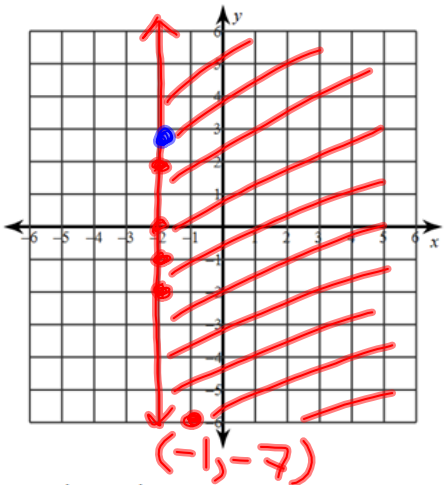
1) **c)** List ordered pairs $(x, y)$ that satisfy the inequality $x \geq -2$.

(-2, 4), (-2, 3000)
(-2, 30), (-2, 100)

| x | y |
|---|---|
| -2 | -2 |
| -2 | -1 |
| -2 | 0 |
| -2 | 2 |

5

**d)** On a coordinate plane, graph the above ordered pairs and **all** ordered pairs that make the inequality $x \geq -2$ true.




shaded = solution

**e)** What does the shaded section of the **number line graph** represent? it represents the solution

**f)** What does the shaded section of the **coordinate plane graph** represent? it represents the solution

**g)** Is the coordinate pair $(-2, 3)$ a solution to the inequality $x \geq -2$? Why or why not?

(-2,3) is a solution b/c $-2 \geq -2$

2)

**c)** List ordered pairs $(x, y)$ that satisfy the inequality $y < -4$.

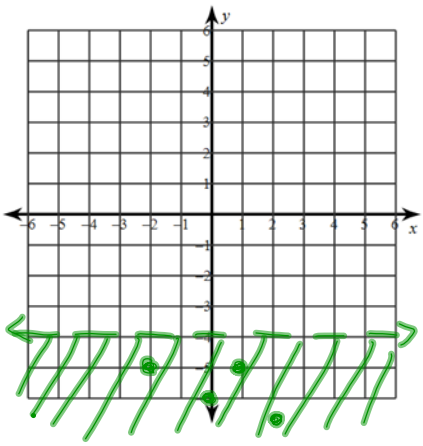
*Can y equal –4 exactly?*

No!

| x | y |
|---|---|
| -2 | -5 |
| 0 | -6 |
| 1 | -5 |
| 2 | -7 |

6

**d)** On a coordinate plane, graph the above ordered pairs and **all** ordered pairs that make the inequality $y < -4$ true.



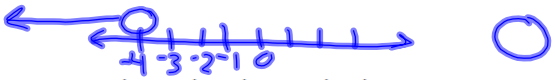
**e)** What does the shaded section of the **number line graph** represent?

the solution

What does the shaded section of the **coordinate plane graph** represent?

the solution

**f)** How, on a **number line**, do you show that the value $y = -4$ is ***not*** included as a solution?

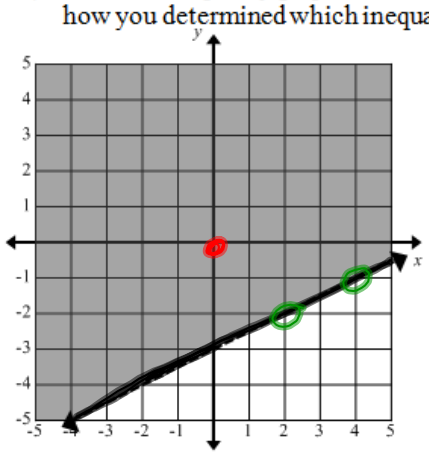


How, in a **coordinate plane**, do you show that an ordered pair containing a $y$-value of $-4$ (for example $(3, -4)$) is ***not*** included as a solution?

dashed line

## Two Variable Inequalities

**7)** For each inequality graphed, determine the correct inequality symbol to correctly represent the graph. Show how you determined which inequality symbol to use.

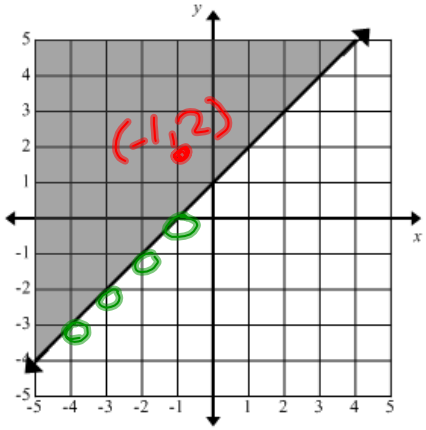


Points on the boundary line

| x | y |
|---|---|
| 4 | -1 |
| 2 | -2 |
| 0 | -3 |
| -2 | -4 |

Points on the boundary line

| x | y |
|---|---|
| -4 | -3 |
| -3 | -2 |
| -2 | -1 |
| -1 | 0 |




**7a)** $y \geq \frac{1}{2}x - 3$

$y = \frac{1}{2}(0) - 3$

$y = -3$

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

$= -1 - 3 = -4$

Check:

$0 \geq ? \frac{1}{2}(0) - 3$

$0 \geq ? -3$

**7b)** $x - y \leq -1$

Check:

$-1 - 2 \leq ? -1$

$-3 \leq ? -1$