

SOL 6.20 – Graphing Inequalities

6.20 The student will graph inequalities on a number line.

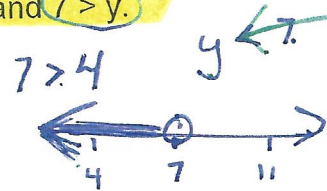
Understanding the Standard:

- Inequalities using the $<$ or $>$ symbols are represented on a number line with an open circle on the number and a shaded line over the solution set.

Ex: $x < 4$



- When graphing $x \leq 4$ fill in the circle above the 4 to indicate that the 4 is included.
- Inequalities using the \leq or \geq symbols are represented on a number line with a closed circle on the number and shaded line in the direction of the solution set.
- The solution set to an inequality is the set of all numbers that make the inequality true.
- It is important for students to see inequalities written with the variable before the inequality symbol and after. For example $x > -6$ and $7 > y$.



You can graph inequality solutions on a number line.

Inequality	Graph	How to Read the Graph
$x > 2$ <i>x is greater than 2</i>		An open dot at 2 shows that 2 is not included. All numbers greater than 2 are included.
$x < 2$ <i>x is less than 2</i>		An open dot at 2 shows that 2 is not included. All numbers less than 2 are included.
$x \geq 2$ <i>x is equal to or greater than 2</i>		A solid dot at 2 shows that 2 is included. All numbers greater than 2 are also included.
$x \leq 5$ <i>x is equal to or less than 2</i>		A solid dot at 2 shows that 2 is included. All numbers less than 2 are also included.

SOL 6.20 – Graphing Inequalities

Inequalities mean **not** equal.

There are four Inequality symbols:

$<$ is less than

\leq is less than or **equal to**

$>$ is greater than

\geq is greater than or **equal to**

When graphing an inequality:

$<$, $>$ are **open circles** because they do not include the number

\leq , \geq are **closed or filled in circles** because they are equal to the number

Specific steps to help graph and inequality:

1. Draw a number line.
2. Ask yourself is the variable (letter) on the left. If not, switch the entire inequality sentence including the symbol.
3. Do you need an open or closed circle?
4. Put the circle on the number on the number line.
5. Use one of the 2 strategies below.
 - If the variable is on the left then the inequality symbol shows you the direction you are shading.
 - Choose a number to fill in for the variable. If it makes the inequality a true statement, then shade that direction; if not shade in the opposite direction.

$<$, $>$ are open
 \leq , \geq are closed
or filled in

Essential Understandings:

In an inequality, does the order of the elements matter?

Yes, the order does matter.

$x > 5$ is not the same as $5 > x$;
however, $x > 5$ is the same as $5 < x$.

Essential Knowledge & Skills:

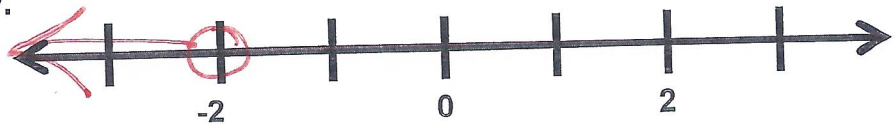
The student will use problem solving, mathematical communication, mathematical reasoning, connections and representation to

- Given a simple inequality with integers, graph the relationship on a number line.
- Given the graph of a simple inequality with integers, represent the inequality two different ways using symbols ($<$, $>$, \leq , \geq).

Practice:

Graph each inequality.

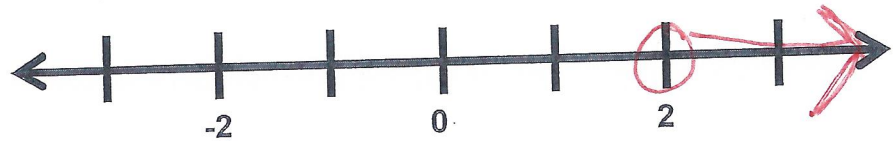
1. $x < -2$



2. $x \geq 2$



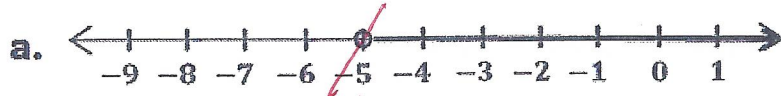
3. $2 < x$



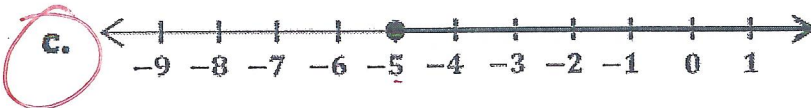
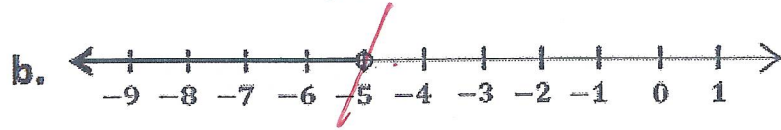
4. $-2 \geq x$



Which graph best represents the inequality $-5 \leq y$?



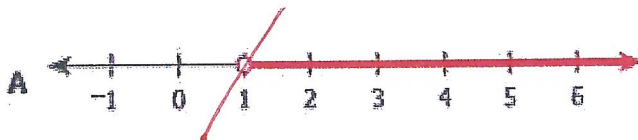
$$y \geq -5$$



Released SOL Questions:

Which graph represents the solution set to this inequality?

$$1 \geq n$$



$$n \leq 1$$

