

Day 8 – Understanding Inequalities

Think About it: What numbers are bigger than -3? List them below.




An **inequality** is a statement that compares two quantities that may or may not be equal. The quantities being compared use one of the following signs:


$<$ $A < B$ A is less than B.	$>$ $A > B$ A is greater than B.	\leq $A \leq B$ A is less than or equal to B.	\geq $A \geq B$ A is greater than or equal to B.	\neq $A \neq B$ A is not equal to B.	\neq \neq
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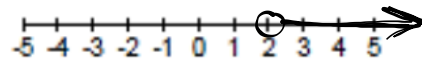

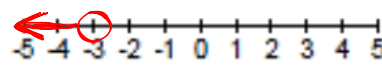

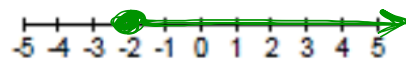

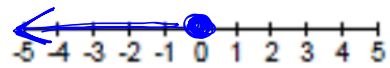

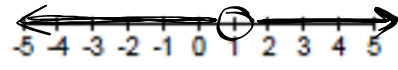
When reading an inequality, you always want to read from the variable. Translate the following inequalities into words. Then name some possible solutions.

- A. $x > 2$ X is greater than 2 Possible Solutions
3, 4, 5, 6, 15
- B. $-3 > p$ p is less than -3 -100, -5, -4, -3.1
- C. $y \leq 0$ y is less than or equal to 0 0, -1, -2/3
- D. $-2 \leq z$ z is greater than or equal to -2 3, -2, 15
- E. $x \neq 1$ x is not equal to 1 4, 2.5 mil, -2.5 mil

When graphing an inequality on a number line, you must pay attention to the sign of the inequality. We use open and closed circles to determine whether the value named in the inequality is part of the solution or not.

 **Open Circles:** They communicate to us that a particular value is NOT included in the solution set.

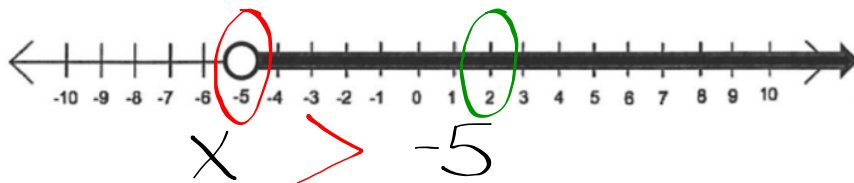
 **Closed Circles:** They communicate to us that a particular value IS included in the solution set.

Words	Example	Circle	Number Line
Greater Than	$x > 2$	Open 	
Less Than	$p < -3$	Open 	
Greater Than or Equal To	$z \geq -2$	Closed 	
Less Than or Equal To	$y \leq 0$	Closed 	
Not Equal To	$x \neq 1$	Open 	

Naming Inequalities from a Graph

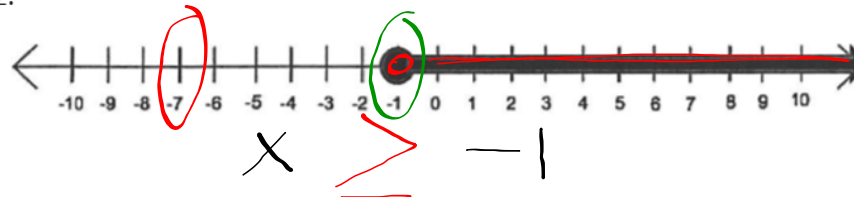
Write an inequality to represent each graph and then determine if the following numbers are solutions:

1.



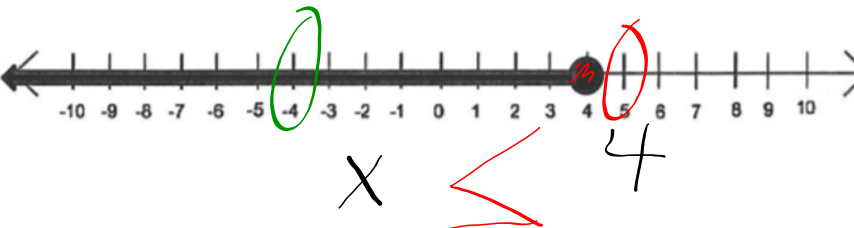
Is 2 a solution? **yes**
Is -5 a solution? **no**

2.



Is -7 a solution? **no**
Is -1 a solution? **yes**

3.



Is -4 a solution? **yes**
Is 5 a solution? **no**

Day 9: Solving Inequalities

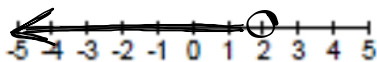
A **solution** to an inequality is any number that makes the inequality true.

Value of x	$x - 4 > -12$	Is the inequality true?
-2	$x - 4 > -12$ $-2 - 4 > -12$ $-6 > -12$ ✓	yes
-8	$-8 - 4 > -12$ $-12 > -12$ ✗	no
-10	$-10 - 4 > -12$ $-14 > -12$ ✗	no

Practice: Solve each inequality and graph. Then name three solutions.

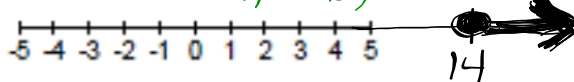
1. $x - 4 < -2$
 $x - 4 + 4 < -2 + 4$
 $x < 2$

-1, 0, -65



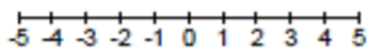
2. $7 \leq \frac{1}{2}x$
 $\frac{2}{1} \cdot 7 \leq \frac{1}{2} \cdot 2 \cdot \frac{2}{1} \cdot \frac{1}{2}x$
 $14 \leq x$

15, 35
1, 2, 5, 6



3. $\frac{x}{4} \neq 9$
 $\frac{x}{4} + 1 \neq 9 + 1$

$x \neq 40$



4. $6x - 5 \leq 7 + 2x$
 $-2x - 2x$
 $4x - 5 \leq 7$
 $+5 +5$

$\frac{4x}{4} \leq \frac{12}{4}$
 $x \leq 3$

