

M9 - 9.1 - Inequalities Notes

The Alligator Eats the Bigger Thing

5 is less than 8

5 is less than 8

$$5 < 8$$

8 is greater than 5

$$8 > 5$$

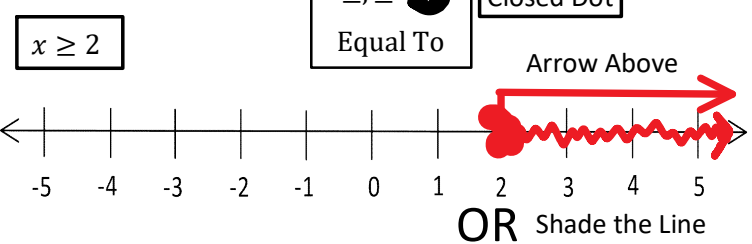
Greater than: $>$
 Greater than or equal to: \geq
 Less than: $<$
 Less than or equal to: \leq
 Does not equal: \neq

7 is less than or equal to 7. $7 \leq 7$

Equal To $\geq \leq$

9 is greater than or equal to 7. $9 \geq 7$

Sketching Inequalities

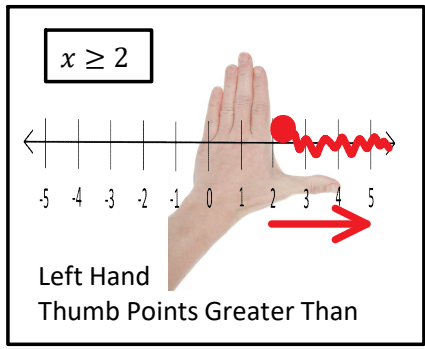


Steps:

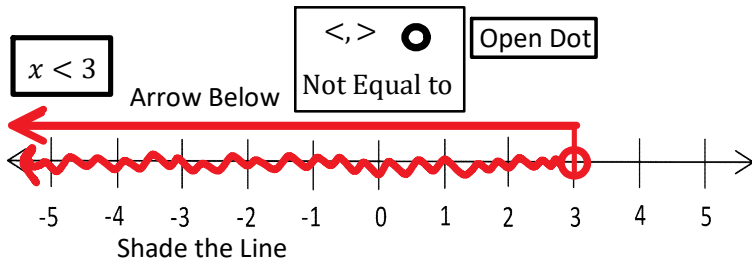
Put a **Closed Dot** at 2 on the Number Line $x = 2$

$$x \geq 2$$

Draw a Line with an Arrow to the Right $x > 2$



$x \geq 2$ Interval Notation $[2, \infty)$
 Equal To $[]$ [Square Brackets]
 $(-\infty, \infty)$

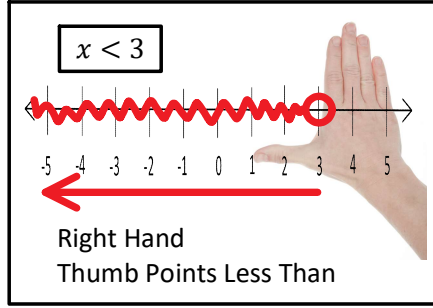


Steps:

Put an **Open Dot** at 3 on the Number Line $x < 3$

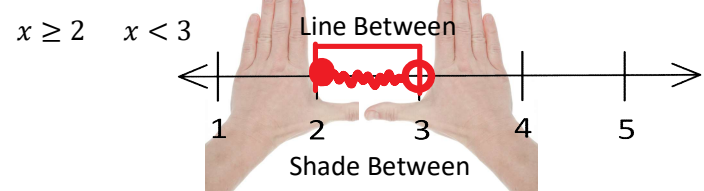
$$x < 3$$

Draw a Line with an Arrow to the Left $x < 3$



$x < 3$ Interval Notation $(-\infty, 3)$
 Not Equal to $()$ (Round Brackets)

Between



$$2 \leq x < 3$$

Interval Notation
 $[2, 3)$

Side by Side in Order* $x \geq 2$ $x < 3$
 Mirror Left $2 \leq x$ $x < 3$

Bring Together $2 \leq x < 3$

Smaller #, Less Than, Variable, Less Than, Bigger #

$-x \leq 4$

$-x \leq 4$ Divide by a Negative
 $x \geq -4$ Change Direction of Sign

Proofs

$-x \leq 4$
 $+x +x$
 $0 \leq 4 + x$
 $-4 -4$ Add x
 $-4 \leq x$ Subtract 4
 $x \geq -4$ Mirror

$-4 \leq x$ Bring it Over Mirror
 $x \geq -4$

Mirror

$a \rightarrow b$ Points to b
 $b \leftarrow a$ Points to b