

5.3 - 5.5 summary

5.3

< OR > Open Circle

Example: $x < 8$

Graph:

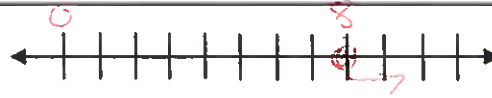


5.3

$\leq$ OR $\geq$ Closed Circle

Example: $8 \geq x$

Graph:



5.3

*If you multiply or divide by a negative when getting the variable by itself, you **MUST** switch the inequality sign.*

Example: $\frac{-2x}{-2} < \frac{8}{-2}$

$x > -4$

Graph:



5.4

Using AND in an Inequality:

Example: $4 < x - 2 < 8$

$$\begin{array}{r} +2 \quad +2 \quad +2 \\ 6 < x < 10 \\ 6 < x \text{ AND } x < 10 \end{array}$$

Graph:



AND
inequalities will
always connect

5.4

Using OR in an Inequality:

Example: $4x \leq 8$ OR $3x > 15$

$$x \leq 2 \text{ OR } x > 5$$

Graph:



OR inequalities will
never connect (make oars)

5.5

Finding the Absolute Value of an Inequality:

There will be 2 answers!

Example: $|x - 2| > 4$

Case 1

$$\begin{array}{l} |x - 2| > 4 \\ x - 2 > 4 \\ x > 6 \end{array}$$

Case 2

$$\begin{array}{l} |x - 2| < -4 \\ x - 2 < -4 \\ x < -2 \end{array}$$

Be sure to
flip the >
sign too.

Example: $|x - 2| \leq 4$

$$-4 \leq x - 2 \leq 4$$

$$-4 \leq x \leq 6$$

same sign,
opposite #

Graph: If the problem starts with a less than AND, it is an "AND" graph and connects (see above).
If the problem starts with a great OR than, it is an "OR" graph and will not touch (see above).

Solve and graph the following problems. Be sure to show your work.

1) $|2d - 8| > 12$

$$\begin{array}{rcl} 2d - 8 > 12 & \text{OR} & 2d - 8 < -12 \\ +8 & & +8 \end{array}$$

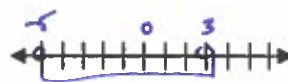
$$d > 10 \text{ or } d < -2$$



2) $|5x + 5| < 20$

$$\begin{array}{rcl} -20 < 5x + 5 < 20 \\ -5 & & -5 \end{array}$$

$$-5 < x < 3$$



3) $|3x + 18| \leq 6$

$$\begin{array}{rcl} -6 & \leq & 3x + 18 \leq 6 \\ -18 & & -18 \end{array}$$

$$-24 \leq 3x \leq -12$$

$$-8 \leq x \leq -4$$



4) $8 \leq -\frac{3}{5}x + 2$ "normal"

$$\begin{array}{rcl} -2 & & -2 \\ (-\frac{5}{3}) & \leq & -\frac{3}{5}x + 2 \end{array}$$

$$-10 \geq x$$

also written as:

$$x \leq -10$$



5) $|7y + 14| - 5 < 30$

$$\begin{array}{rcl} +5 & +5 \\ 7y + 14 & < & 35 \end{array}$$

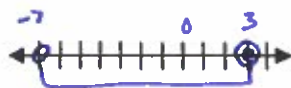
AND!

$$7y + 14 < 35 \text{ OR } 7y + 14 > -35$$

$$y < 3 \text{ or } y > -7$$

$$-35 < 7y + 14 < 35$$

$$-7 < y < 3$$



6) $5 < x + 2 < 7$

$$\begin{array}{rcl} -2 & -2 & -2 \end{array}$$

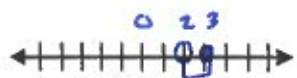
$$3 < x < 5$$



7) $5 \geq 2x - 1 > 3$

$$\begin{array}{rcl} +1 & +1 & +1 \end{array}$$

$$3 \geq x > 2$$



8) $x + 6 < 5$ or $-3x \leq -15$

$$\begin{array}{rcl} -6 & -6 & -3 \end{array}$$

$$x < -1 \text{ or } x \geq 5$$

