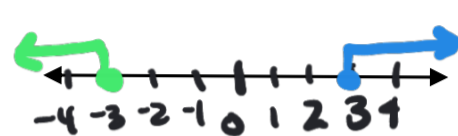

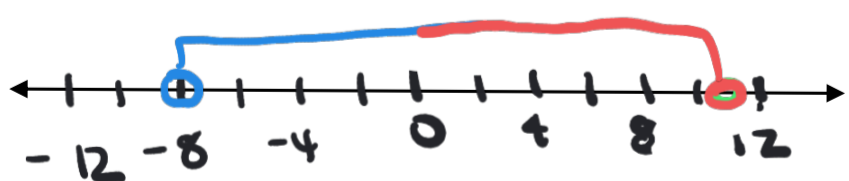


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Lesson 1.5 Absolute Value Inequalities Notes

<u>Absolute Value Inequalities</u>	<p>Case 1: GREATER THAN & GREATER THAN OR EQUAL TO Great or</p> <p>$x \geq 3$ OR Union $x \geq 3$ OR $x \leq -3$</p>  <p>Interval Notation (-∞, -3] ∪ [3, ∞)</p>
	<p>Case 2: LESS THAN & LESS THAN OR EQUAL TO Less than and</p> <p>$x \leq 4$ AND Intersection $x \leq 4$ AND $x \geq -4$</p> <p>$-4 \leq x \leq 4$</p>  <p>Interval Notation [-4, 4]</p>
What does this mean?	Absolute value inequalities are compound inequalities.
HOW TO SOLVE Absolute Value Inequalities	<ol style="list-style-type: none"> 1. Isolate the absolute value expression. 2. Write 2 inequalities. 3. Solve both inequalities 4. Graph the solutions and also write them in interval notation.
Directions: Solve, graph, and write each solution in interval notation.	
Ex:	<p>$2x - 3 < 19$ < is an AND</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> $\begin{array}{r} 2x - 3 < 19 \\ + 3 \quad + 3 \\ \hline 2x < 22 \\ \frac{2x}{2} < \frac{22}{2} \\ x < 11 \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 2x - 3 > -19 \\ + 3 \quad + 3 \\ \hline 2x > -16 \\ \frac{2x}{2} > \frac{-16}{2} \\ x > -8 \end{array}$ </div> </div> <p>$x < 11$ AND $x > -8$</p> <div style="text-align: right; border: 2px solid green; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> $-8 < x < 11$ </div>  <p>Interval Notation: (-8, 11)</p>

Ex2:

$$9|3-k| - 5 \geq 67$$

$$\frac{9|3-k| - 5 + 5}{9} \geq \frac{67 + 5}{9}$$

$$|3-k| \geq 8$$

OR

$$\frac{3-k \geq 8}{-3 \quad -3}$$

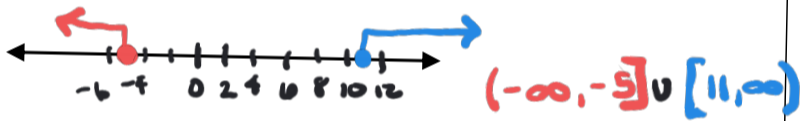
$$\frac{-k \geq 5}{-1 \quad -1}$$

$$k \leq -5 \text{ OR}$$

$$\frac{3-k \leq -8}{-3 \quad -3}$$

$$\frac{-k \leq -11}{-1 \quad -1}$$

$$k \geq 11$$



Ex3:

$$\frac{-10|2r-1| \leq -60}{-10 \quad -10}$$

$$|2r-1| \geq 6 \text{ reverse sign}$$

$$\frac{2r-1 \geq 6}{+1 \quad +1}$$

$$\frac{2r \geq 7}{2 \quad 2}$$

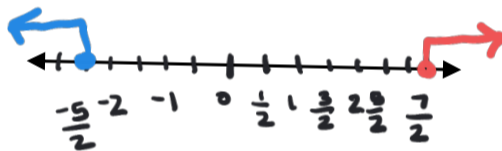
$$r \geq \frac{7}{2} \text{ OR}$$

$$\frac{2r-1 \leq -6}{+1 \quad +1}$$

$$\frac{2r \leq -5}{2 \quad 2}$$

$$r \leq -\frac{5}{2}$$

$$(-\infty, -\frac{5}{2}] \cup [\frac{7}{2}, \infty)$$



Ex5:

$$6|-5n| + 7 > 37$$

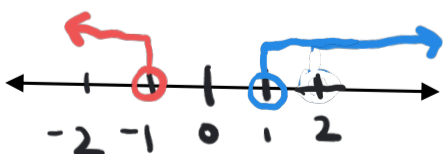
$$\frac{6|-5n| + 7 - 7}{6} > \frac{37 - 7}{6}$$

$$|-5n| > 5 \text{ OR}$$

$$\frac{-5n > 5}{-5 \quad -5} \text{ OR } \frac{-5n < -5}{-5 \quad -5}$$

$$n < -1 \text{ OR } n > 1$$

$$(-\infty, -1) \cup (1, \infty)$$



Ex7:

$$4|9-3n| - 9 < 75$$

$$\frac{4|9-3n| - 9 + 9}{4} < \frac{75 + 9}{4}$$

$$|9-3n| < 21$$

$$9-3n < 21 \text{ and } 9-3n > 21$$

$$\frac{9-3n < 21}{-9 \quad -9} \rightarrow \frac{-3n < 12}{-3 \quad -3}$$

$$n > -4 \text{ AND}$$

$$\frac{9-3n > 21}{-9 \quad -9} \rightarrow \frac{-3n > -30}{-3 \quad -3}$$

$$n < 10$$

$$-4 < n < 10$$



$$(-4, 10)$$