Lesson 5: Sec. 1-7 Solving Absolute Value Inequalities

Objectives:

~ Solve compound inequalities using AND and OR

~ Solve inequalities involving Absolute Values

~ Graph solutions on a number line

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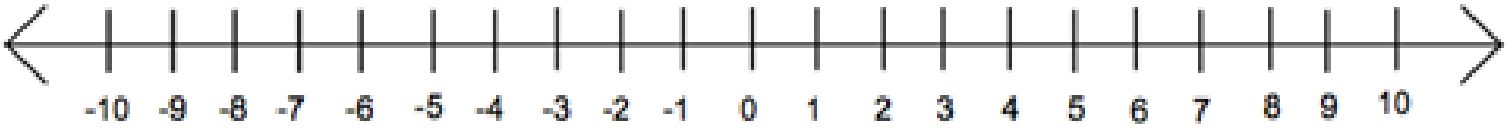
Compound Inequalities are inequalities that have more than one part.

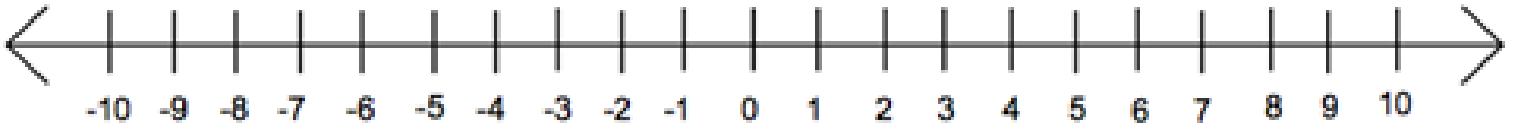
- **The first kind of Compound Inequality is an "Intersection" - also called an "and".**

Ex: $-2 < x < 6$



- **The second kind of Compound Inequality is a "Union" - also called an "or".**

Ex: $x < -3$ or $x > 5$



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Ex 1: Solve and graph. Solve all three parts at the same time.

$9 < 3x + 6 < 15$

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Ex 2: Solve and graph. Solve separately.

$$x - 3 > 1 \quad \text{or} \quad x + 2 < 1$$

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Ex 3: Solve and graph.

"And" or "Or"?

$|y| < 7$

Hint: "Shade Between" or "Shade Opposite"?

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Solve and graph.

Ex 4: $|2x + 4| \geq 12$ "And" or "Or"?

Hint: "Shade Between" or "Shade Opposite"?

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Compare and Contrast:

What does the direction of the inequality sign tell us about our final answer and graph?

$|y| < 7$

$|2x + 4| \geq 12$

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Solve and graph.

Ex 5: $3|2x - 9| - 21 \leq 6$

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Solve and graph.

Ex 6: $-2|x + 3| + 1 < -17$

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STOP AND THINK!!

Just like with Absolute values, we have some special cases (remember that absolute values can't equal a negative?).

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Special Case #1:

An absolute value that is $<$ or $\leq$ a negative number will never have a solution.

This is because an abs. val. is the distance from zero. Distance can never be less than zero (a negative).

Example: $|2x + 6| < -12$

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Solve and graph.

Ex 7: $|x - 4| + 6 \leq 1$

Special Case #2:

An absolute value that is > or ≥ a negative number will have a solution of all real numbers.

This is because an abs. val. is the distance from zero. Distance will always be greater than zero (a negative).

Example: $|x + 2| > -4$

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Solve and graph.

Ex 8: $|5x - 2| + 15 \geq 10$

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Can you?

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Homework: *Take note of different due dates.

Review for Test 1 worksheet

Due beginning of class next time.

Assignment 5

Due Beginning of class the day AFTER test day.