Algebra 1
Unit 3 Lesson 5 Notes
Absolute Value Inequalities

I. REVIEW: What does absolute value mean?

II. Absolute Value Inequalities

a.

Inequality	What it means	What is looks like
$\|x\| = 6$	What #'s are 6 spaces from 0 on a number line?	
$\|x\| < 6$	What #'s are **LESS THAN** 6 spaces from 0 on a # line?	
$\|x\| > 6$	What #'s are **GREATER THAN** 6 spaces from 0 on a # line?	
$\|x\| < -6$	What #'s are **LESS THAN -6** spaces from 0 on a # line?	
$\|x\| > -6$	What #'s are **GREATER THAN -6** spaces from 0 on a # line?	

****** REMEMBER:

LESS THAN: AND PROBLEM GREATER THAN: OR PROBLEM

Examples: Graph the solutions.

1. $|x| < 4$ 2. $|x| > 8$ 3. $|x| \geq 2$

To solve absolute value inequalities:

1. Get the absolute value by itself on the left hand side (isolate it!)

2. Determine if it is an "and" or an "or" problem

   a. For an "**and**" problem < or ≤: rewrite as the negative on the left, the absolute value (without the bracket) is in the middle, and the positive number is on the right. Solve and graph.

   b. For an "**or**" problem > or ≥: write 2 separate inequalities: the first one stays the same as the problem (just remove the brackets) and the second one needs to have the inequality sign flipped AND use the opposite of the number!

3. Check for extraneous solutions (they look like a solution but don't work when you put them back into the original problem)!

4. Graph your answer

Examples:

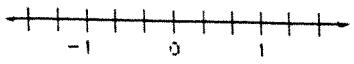
1. $|2x - 7| < 9$

2. $|x + 8| - 4 \geq 2$

3. $3|x - 6| > 9$

4. $|6x - 11| \leq 7$

5. $-2 \mid 6x - 1 \mid + 5 < 3$



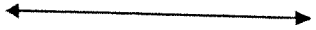
Checkpoint for the Graphic Organizer

Solve the inequality. Then graph the solution.

1. $|x + 4| \geq 6$

2. $|2x - 7| > 1$

3. $|3x + 5| \geq 10$



4. $|x + 2| < 6$

5. $|2x + 1| \leq 9$

6. $|7 - x| \leq 4$