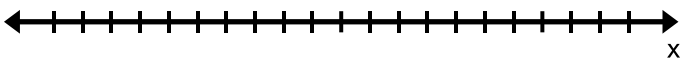
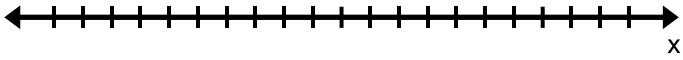
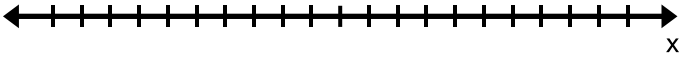
Name: _____ Date: _____ Period: _____

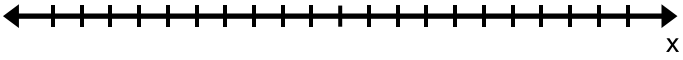
Unit 1 Day 7 - Solving Absolute Value Inequalities Classwork

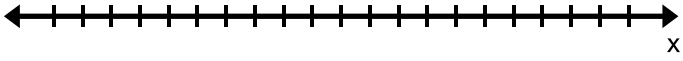
Use mental math to solve the following, and graph the solutions on the number line. Then write a compound inequality to represent the graph.

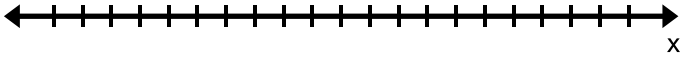
1. a) $|x + 3| = 5$  equality:

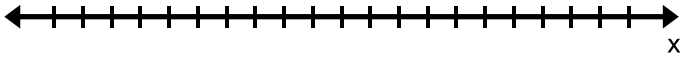
   b) $|x + 3| \leq 5$  inequality:

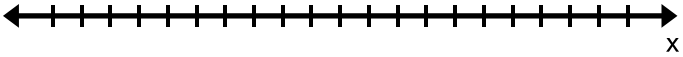
   c) $|x + 3| \geq 5$  inequality:

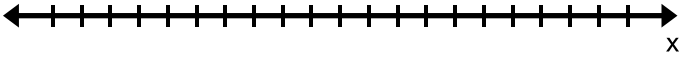
   d) $|x + 3| < 5$  inequality:

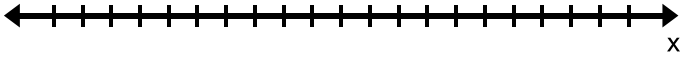
   e) $|x + 3| > 5$  inequality:

2. a) $|x - 4| = 6$  equality:

   b) $|x - 4| \leq 6$  inequality:

   c) $|x - 4| \geq 6$  inequality:

   d) $|x - 4| < 6$  inequality:

   e) $|x - 4| > 6$  inequality:

3. What kinds of patterns did you notice for the first two sets of problems?

4. Check to see if the following integers are solutions to this inequality: $|10 - x| \leq 15$

a) 1 b) 30 c) -11 d) 0 e) -5

5. When you solved #1a on the front page, you got x = 2 or x = -8 as possible solutions. This would mean that you could have rewritten $|x + 3| = 5$ as x + 3 = 5 and solved it to get x = 2. How could you set up $|x + 3| = 5$ to get an equation with x = -8 as a solution?

6. Use the equation from #2a: $|x - 4| = 6$ to write two equations you can solve algebraically to arrive at x = 10 or x = -2 for solutions.

7. Jimmy and Susie sit next to each other in math class. Their teacher asked them to solve this inequality: $|x + 4| - 3 = 5$

Jimmy solved it this way:

	$\|x + 4\| - 3 = 5$		(wrote two equations)
x + 4 – 3 = 5	or	x + 4 – 3 = -5	(combined 4 and -3 to get 1)
x + 1 = 5	or	x + 1 = -5	(subtracted 1 from each side)
x = 4	or	x = -6	

Susie solved it this way:

$|x + 4| - 3 = 5$

$|x + 4| = 8$ (added 3 to both sides to isolate the absolute value grouping.)

x + 4 = 8	or	x + 4 = -8	(wrote two equations)
x = 4	or	x = -12	(subtracted 4 from each side)

Check the solutions to decide who solved it correctly.

What does this tell you about <u>when</u> to separate the absolute value into 2 equations?

<u>Solve</u> the following. Then <u>graph</u> the solutions on the number line and <u>write the compound inequality</u> representing the solutions.

8. $2|x + 5| + 7 = 19$

9. $2|x + 5| + 7 \geq 19$