

Absolute Value and Compound Inequalities

Name Answer Key
Block _____ Date 8/30/17

Examples:

A. $|2x-3|+2 > 7$
or statement.

$|2x-3| > 5$
SPLIT
 $2x-3 > 5$ or $-(2x-3) > 5$
 $2x > 8$ or $-2x+3 > 5$
 $x > 4$ or $-2x > 2$
 $x < -1$

B. $2 \leq \frac{x+5}{3} < 4$

$(3) 2 \leq \frac{x+5}{3} < 4(3)$
 $6 \leq x+5 < 12$
 $1 \leq x < 7$

No Solutions or
All Real Numbers?

- C. $|x+3| = -2$ No solutions
D. $|2x+3| > -5$ All Real Numbers
E. $|2x+3| < -5$ No solutions
F. $-|x+2| \leq 5$ All real Numbers

Be able to explain why.

1. $|4x+5|-1 \geq 20$

$|4x+5| \geq 21$
 $4x+5 \geq 21$ or $-(4x+5) \geq 21$
 $4x \geq 16$ or $-4x-5 \geq 21$
 $x \geq 4$ or $-4x \geq 26$
 $x \leq -6.5$

2. $-3 < 2x-7 < 7$

$-3 < 2x-7 < 7$
 $+7 +7$
 $4 < 2x < 14$
 $2 < x < 7$

3. $|2x+5|+7 > 4$

$|2x+5| > -3$
STOP

All Real Numbers.

The left will be positive which is always greater than

Set up and solve on a separate sheet of paper. Some problems have no solutions or all real number solutions.

4. $|2x-3| < -9$

No Solution

5. $-|x+3| > 9$

No Solution

6. $|3-3x| \geq 9$

$|3-3x| \geq 9$
 $-3-3x \geq 9$ or $-(3-3x) \geq 9$
 $-3-3x \geq 9$ or $-3+3x \geq 9$
 $-3x \geq 12$ or $3x \geq 12$
 $x \leq -4$ or $x \geq 4$

7. $|9x+1| \geq -9$

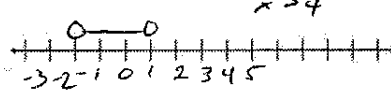
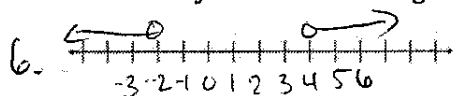
All real numbers

8. $|2x+1| = -9$

No Solution

9. $|2x+1|-12 \leq -9$

Hint: Only two need to be graphed on a number line.

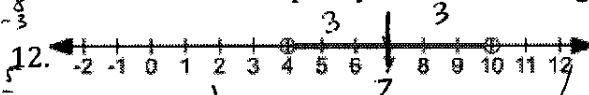


$|2x+1| - 12 \leq -9$
 $|2x+1| \leq 3$
 $2x+1 \leq 3$ or $-(2x+1) \leq 3$
 $2x \leq 2$ or $-2x-1 \leq 3$
 $x \leq 1$ or $-2x \leq 4$
 $x \geq -2$

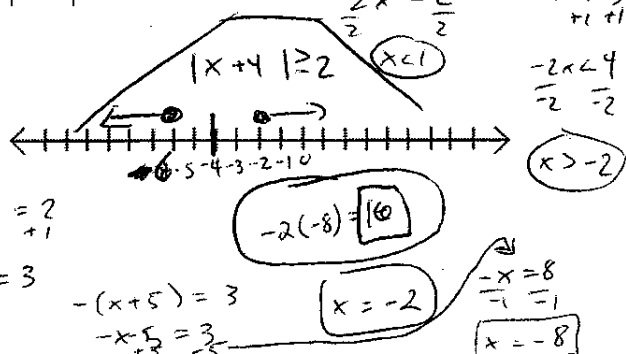
10. What is the SUM of the solutions to the equation $|2x-3|=8$?

11. What is the PRODUCT of the solutions to the equation $|x+5|-1=2$?

Write an absolute inequality for the following graphs.



13.



$|x-7| < 3$
 $x-7 < 3$ or $-(x-7) < 3$
 $x < 10$ or $-x+7 < 3$
 $x > 4$

$|x+5|-1=2$
 $|x+5|=3$
 $x+5=3$ or $-(x+5)=3$
 $x=-2$ or $-x-5=3$
 $x=-8$

$5.5 + -2.5 = 3$