

Solving Absolute Value Inequalities Notes

Important Information

Follow these steps to solve an equation with an absolute value algebraically...

1st- Isolate the absolute value on one side of the equation.

2nd- Determine the possible values of the number inside the absolute value. For example, if

$$|2x + 3| = 7,$$

then $(2x+3)$ must equal either 7 or -7.

3rd- Set up new equations with BOTH possible values and solve both equations for the variable. Your solution is both of the solutions.

Example:

$$5|2x + 3| - 6 = 29$$

$$5|2x + 3| = 35$$

$$|2x + 3| = \frac{35}{5}$$

$$|2x + 3| = 7$$

$(2x + 3)$ must equal 7 or -7

$$|2x + 3| = 7$$



$$2x + 3 = 7$$

or

$$2x + 3 = -7$$

$$2x = 4$$

$$2x = -10$$

$$x = 2$$

$$x = -5$$



Things to Remember

NOTE: You can **NOT** distribute over the absolute value sign.

$$-2|3 + 1| \neq |-2(3) + -2(1)|$$

*Solve until you only have absolute value on one side THEN split your equation/inequality.

*When splitting your inequality, flip the inequality symbol on the one that is a negative.

SUPER IMPORTANT!!!- If you are solving an inequality and you **multiply and/or divide by a negative number**, you **MUST flip the inequality sign the other direction**.

Another Example:

Write your own example of an inequality with an absolute value in it. Solve your inequality.

Graph your solution on a number line below..