

# Solving Absolute Value Inequalities Notes

## Important Information

Solve absolute value inequalities until the absolute value is on one side by itself.

Then look closely at the problem **BEFORE** you split!

If  $| \quad | \leq - \#$  or  $| \quad | < - \#$  then there is no solution because this can **NEVER** be true.

If  $| \quad | < 0$  then there is also no solution because this can **NEVER** be true.

If  $| \quad | > - \#$  then it is infinite solutions because this is **ALWAYS** true.

Example:

$$\begin{aligned} 9|x - 2| - 10 &< -73 \\ + 10 &+ 10 \\ 9|x - 2| &< -63 \\ \div 9 &\div 9 \\ |x - 2| &< -7 \end{aligned}$$

Pause and look... the left side will make a positive number and a positive is **NEVER** less than a negative number.

No Solutions

Example:

$$\begin{aligned} 3 + 4|3x + 7| &\geq -89 \\ - 3 &- 3 \\ 4|3x + 7| &\geq -92 \\ \div 4 &\div 4 \\ |3x + 7| &\geq -23 \end{aligned}$$

Pause and look... the left side will make a positive number and a positive is **ALWAYS** greater than a negative number.

Infinite Solutions

Your Example:

Write your own 2 examples of absolute value inequalities.

- 1 problem that ends in infinite solutions
- 1 problem that ends in no solutions
- Both problems **MUST** have at least 1 step to do before you get to the absolute value on one side by itself
- Then solve your inequalities.