

### 1.7: Absolute Value Inequalities

“I WILL ...

Simplify and Solve absolute value inequalities.”

#### I. Definitions

- A. Identify whether it is an AND/OR inequality
- B. Write both equations with one with the regular sign and other equation with the sign SWITCHED with OPPOSITE number
- C. Solve each inequality and write answer in inequality and/or interval notation
- D. Check each solution and make sure there aren't any extraneous solutions
- E. Graph appropriately on number line

#### II. Types of Numbers.

- A. Isolate the absolute value equation.
- B. Write two equations, with one answer being \_\_\_\_\_ and other is \_\_\_\_\_.
- C. Solve each equation.
- D. Check by plugging each solution and make sure there aren't any extraneous solutions.

#### III. Absolute Value Applications

- A. To write the equation:
  - a.  $|\text{actual amount} - \text{ideal amount}| \leq \text{tolerance}$
- B. Tolerance is the max accepted deviation of an item from some ideal or mean
  - a.  $\text{Tolerance} = (\text{High End}) - (\text{Avg of Low and High Ends})$
- C. If the problem is “within range,” apply  $\leq$  (AND), “acceptable”
- D. If the problem is “out of range,” apply  $>$  (OR), “unacceptable”

IV. Model Problems

Ex 1: Solve $ x + 4  \leq 5$ and graph the solution on a number line.	Ex 2: Solve $ 4x + 5  > 13$ and graph the solution on a number line.
Ex 3: Solve $ 1/7x + 2  - 5 < 3$ and graph the solution on a number line.	Your Turn: Solve $ 2x - 5  \geq x + 1$ and graph the solution on a number line.
Ex 4: Solve $3 12 - 4x  + 4 \leq 28$ and graph the solution on a number line.	Ex 5: Solve $8 x + 4  > 48$ and graph the solution on a number line.
Ex 6: Solve $\frac{ 4x + 8 }{3} < 8$ and graph the solution on a number line	Your Turn: Solve $\left  \frac{x + 2}{3} \right  < 1$ and graph the solution on a number line

Ex 7: Solve $ 2x - 1  < -25$ and graph the solution on a number line.	Ex 8: Solve $ x + 1  \geq -16$ and graph the solution on a number line.
Your Turn: Solve $-2 x + 4  \leq 22$ and graph the solution on a number line.	Ex 9: A manufacturer has a 0.6oz tolerance for a bottle of salad dressing advertised as 16oz. Write and solve an absolute value inequality that describes the acceptable volumes for “16oz” bottles.
Ex 10: A manufacturer has a tolerance of 0.36 lb for a bag of potting soil advertised as 9.6 lb. Write and solve an absolute value inequality that describes unacceptable weights for “9.6 lb” bags.	Your Turn: A food manufacture specifies that every family size box of cereal should have a net weight of 25 ounces, with a tolerance of 1.2 ounces. Write and solve an absolute value inequality that describes the acceptable net weights for the cereal in a family size box.

**Assignment: Worksheet**