

# Solving Absolute Value Equations and Inequalities

## EQUATIONS:

Steps: Isolate the absolute value (Can it happen?)  
Set one equal to original  
Set one equal to the negative version  
Check your answers

Things to think about!

Can this happen?  
 $|x| = -3$

Solve each absolute value equation.

1.  $|3 + 4x| = 23$

2.  $|x + 8| - 5 = 2$

3.  $-5|5x - 5| + 2 = -73$

4.  $|x - 2| = 2x$

5.  $\left|\frac{-3+x}{4}\right| = 1$

6.  $5 - \left|\frac{x}{2} + 3\right| = -1$

7.  $3|6x - 9| + 4 = 9x - 5$

## INEQUALITIES:

Steps: Isolate the absolute value  
Determine if it can happen  
Set up two inequalities and solve

Once the absolute value is isolated, check to see what inequality symbol you have.

$$\begin{array}{ccc} > & \geq & \\ |x - 2| & \geq & 5 \end{array}$$

GREATOR

$$\begin{array}{ccc} < & \leq & \\ |x + 5| & < & 4 \end{array}$$

LESSTHAND

## Solving Absolute Value Equations and Inequalities

Solve each inequality. (Graph solution on number line)

1.  $|x - 20| > 5$

2.  $|x - 3| \leq 4$

3.  $|4 - 8b| < -23$

4.  $5 < |x + 1| < 7$

5.  $|x + 5| - 1 < -8$

6.  $-2|x + 3| \leq 6$

7.  $|3x + 4| - 7 \leq 7$

8.  $7|x + 2| + 8 \geq 29$

9.  $-|4 - 8b| - 7 < 12$