

Mat 0024 – Section 2.6 - Inequalities

I. Solving Inequalities

To solve an inequality, apply the equation solving techniques of: “**Get rid of**”

1. **Parentheses by using the distributive property.**
2. **Denominators: Multiply each side of equation by common denominator.**
Decimals: Multiply each side of equation by 10, 100, 1000, etc.
3. **Like terms on the same side by combining**
Goal: The equation should be no more complicated than: $4x - 8 = -7x + 9$
4. **Signs (addition or subtraction) by using the addition principle (**add opposites**).**
Get variable terms on one side of the equation and all constant terms on the other side.
Goal: The equation should be no more complicated than: $4x = -9$
5. **Coefficients by dividing by coefficient (BY SAME NUMBER).** Goal: $x = \text{number}$

Two additional rules must be applied when solving an inequality:

1. When you multiply or divide an inequality by a negative number you must reverse the inequality symbol.
2. The variable must be on the left.

Use these rules to solve the following inequalities:

$$(1) 2x + 1 > -5$$

$$(2) 1 - 3x > -8$$

$$(3) 2(2x + 1) \geq 10$$

$$(4) \frac{x}{2} + 1 \leq -5$$

$$(5) 5(x-1) \leq 8x - (5 + 2x)$$

$$(6) \frac{3}{4}(3x - 1) > \frac{11}{2}$$

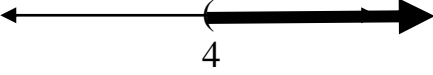
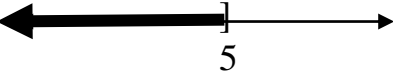


You Try: a. $3 - 4x > 17$

b. $4(x + 2) \leq 6(x - 5)$

B. Three Forms of a Solution

Complete the following chart, remembering that $<$ and $>$ are represented by parentheses while

\leq and \geq are represented by brackets. Interval is always expressed from LEFT to RIGHT (smallest to largest value). And use the symbols ∞ and $-\infty$ to represent infinity and negative infinity.

Solution	Set Builder Notation	Number Line	Interval Notation
1. $x > 10$	$\{x \mid x > 4\}$		$(4, \infty)$
2. $x \leq 5$	$\{x \mid x \leq 5\}$		$(-\infty, 5]$
3. $x \geq -2$			
4. $x < 0$			

C. Determine whether the given number is a solution.

1) $x \geq -3$

a) -3

b) 0

2) $x < 5.7$

a) 5.7

b) 4

Solve the following inequalities and express the solution on a number line.

(1) $-2x > 6$

(2) $4 - 3x < -8$

(3) $2(2x + 1) \geq 10$

(4) $\frac{x+6}{3} \leq 2$

(5) $\frac{1}{2}(x-4) \geq -x + 1$