

# Unit 5: Inequalities, Systems of Inequalities and Systems of Equations

Inequalities:

1. Linear inequalities in one variable – graphed on a horizontal number line.
2. Linear inequalities in two variables – graphed in a coordinate system.
3. Quadratic inequalities in two variables – graphed in a coordinate system.
4. Quadratic inequalities in one variable – graphed on a horizontal number line.

Systems of Inequalities:

1. Systems of linear inequalities.
2. Systems of linear and quadratic inequalities – L4 only.

Systems of Equations:

1. Linear-Linear systems.
2. Quadratic-Linear systems.
3. Quadratic-Quadratic systems.

- There are two types of inequality symbols:

Strict	Meaning	Other	Meaning

- Recall: When solving inequalities algebraically, you have to remember to reverse (flip) the inequality symbol whenever you divide or multiply by a negative number.

- If you are not given an inequality that has the variable on the left side, rewrite the inequality so the variable is on the left and the numerical value is on the right. Such inequality is easier to graph on a number line.

Original inequality	Rewritten inequality	Original inequality	Rewritten inequality

- When solving a linear inequality in one variable algebraically and all variables cancel out (add up to zero) you have to determine whether the simplified statement is true – then the inequality has a solution that is all real numbers; or the simplified statement is false – then the inequality has no real solutions.

Ex.1:

Solve and graph  $2x + 5 - x > x + 8$

Ex.2:

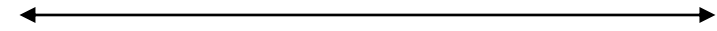

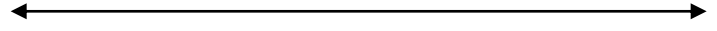
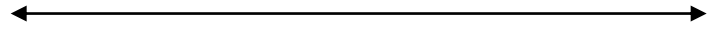
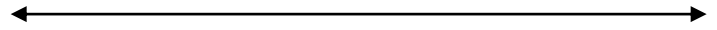
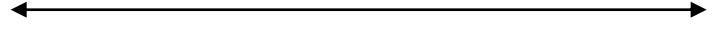
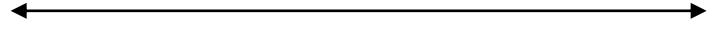


Solve and graph  $x - 12 + 5x \leq 2x + 8 + 4x$

# Linear Inequalities on One Variable – Review

## 1. Graph the given inequalities.

1	$-8 < x \leq 15$	
2	$18 < -3x < 21$	
3	$2x \leq -4$	
4	$16 \leq -x$	
5	$x \leq 24$ or $68 < 2x$	
6	$8x - 7 \geq 3x + 5 + 3x$	
7	$-x - 7 > 3x - 16 - 4x$	
8	$-1000 \geq 2x$	

2. Write each inequality graphed on the number line.

1		
2		
3		
4		
5		
6		
7		
8		
9		
10	