






# Solving Inequalities

## Inequality Symbol

$>$	"greater than"	$x > 2$	
$<$	"less than"	$x < 2$	
$\geq$	"greater than or equal to"	$x \geq 2$	
$\leq$	"less than or equal to"	$x \leq 2$	
$\neq$	"not equal to"	$x \neq 2$	

## Solve the Equation

$$x + 6 = 15$$

$$\quad -6 \quad -6$$

$$x = 9$$

$$x - 7 = -9$$

$$\quad +7 \quad +7$$

$$x = -2$$

$$\frac{2x}{2} = \frac{6}{2}$$

$$x = 3$$

$$\frac{-2x}{-2} = \frac{6}{-2}$$

$$x = -3$$

## Solve the Inequality

$$x + 6 \geq 15$$

$$\quad -6 \quad -6$$

$$x \geq 9$$

$$x - 7 < -9$$

$$\quad +7 \quad +7$$

$$x < -2$$

$$\frac{2x}{2} < \frac{6}{2}$$

$$x < 3$$

$$\frac{-2x}{-2} < \frac{6}{-2}$$

$$x > -3$$

$$\frac{x}{1} \cdot \frac{1}{3} = 4 \cdot \frac{3}{1}$$

$$x = 12$$

$$\frac{-x}{1} \cdot \frac{1}{3} = 4 \cdot \frac{-3}{1}$$

$$x = -12$$

$$\frac{x}{1} \cdot \frac{1}{3} > 4 \cdot \frac{3}{1}$$

$$x > 12$$

$$\frac{-x}{1} \cdot \frac{1}{3} > 4 \cdot \frac{-3}{1}$$

$$x < -12$$

Directions: Solve the inequality and graph the solution on a number line.

1.  $6 > x - 4$

$$+4 \quad +4$$

$$10 > x$$

$$\boxed{x < 10}$$



2.  $y + \frac{3}{5} \leq \frac{7}{10}$

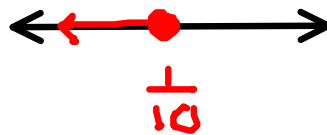
$$-\frac{3}{5} \quad -\frac{3}{5}$$

$$\frac{7}{10} - \frac{3 \cdot 2}{5 \cdot 2}$$

LCD = 10

$$\frac{7}{10} - \frac{6}{10} = \frac{1}{10}$$

$$\boxed{y \leq \frac{1}{10}}$$



3.  $2x + 8 \geq 11$

$$-8 \quad -8$$

$$\frac{2x}{2} \geq \frac{3}{2}$$

$$\boxed{x \geq \frac{3}{2}}$$



4.  $3 - 4x < 16$

$$-3 \quad -8$$

$$\frac{-4x}{-4} < \frac{8}{-4}$$

$$\boxed{x > -2}$$

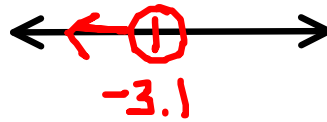


$$5. -3b - 7 > 2.3$$

$$+7 +7.0$$

$$\frac{-3b > 9.3}{-3 \quad -3}$$

$$\boxed{b < -3.1}$$



$$6. -\frac{x}{3} + 4 \leq 10$$

$$\frac{x}{-3} + 4 \leq 10$$

$$-4 \quad -4$$

$$\frac{-3 \cdot x}{-3} \leq 6 \cdot -3$$

$$\boxed{x \geq -18}$$

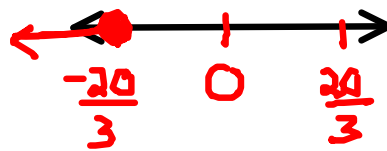


$$7. \frac{6}{5}x + 22 \leq 14$$

$$-22 \quad -22$$

$$\frac{5}{4} \cdot \frac{6}{5} x \leq -\frac{8}{1} \cdot \frac{5}{6} = -\frac{20}{3}$$

$$\boxed{x \leq -\frac{20}{3}}$$



8.  $7x - 2(x-1) > -48$

$$7x - 2x + 2 > -48$$

$$5x + 2 > -48$$

-2      -2

$$\frac{5x}{5} > \frac{-50}{5}$$

$$x > -10$$



9.  $2x + 1 < 5x - 8$

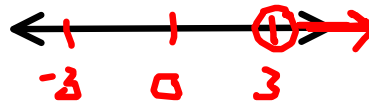
$$-5x - 5x$$

$$-3x + 1 < -8$$

-1      -1

$$\frac{-3x}{-3} < \frac{-9}{-3}$$

$$x > 3$$



10.  $y + 5 + 5y \geq -7$

$$6y + 5 \geq -7$$

-5      -5

$$\frac{6y}{6} \geq \frac{-12}{6}$$

$$y \geq -2$$



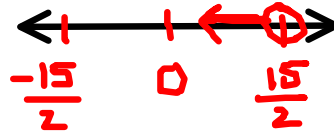
11.  $3x - (x-7) < 22$

$3x - 1(x-7) < 22$

$3x - 1x + 7 < 22$

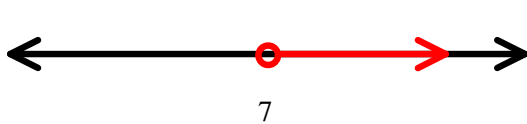
$2x + 7 < 22$

$\frac{2x}{2} < \frac{15}{2}$       $x < \frac{15}{2}$



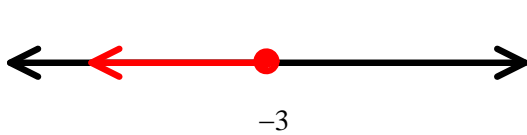
Directions: Write an inequality that describes the set of points graphed on each number line.

12.



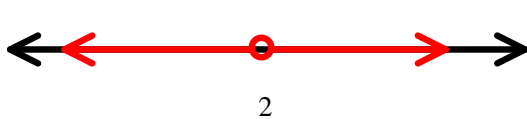
$x > 7$

13.



$x \leq -3$

14.



$x \neq 2$

$>$	$<$	$\geq$	$\leq$
greater than above more than	less than under	greater than or equal to at least minimum value	less than or equal to at most no more than without exceeding maximum value

Directions: Write an inequality to represent each situation.

15. A temperature of at least  $70^\circ$ .

$t \geq 70^\circ$

16. The cost of a shirt is no more than \$30.

$c \leq 30$