

## One-Step Inequalities Involving Addition & Subtraction

Example 1:

$$\begin{array}{r} x + 7 > 13 \\ -7 \quad -7 \\ \hline x > 6 \end{array}$$

Example 2:

$$\begin{array}{r} x - 8 \leq -19 \\ +8 \quad +8 \\ \hline x \leq -11 \end{array}$$

Example 3:

$$\begin{array}{r} x + 6 \geq -21 \\ -6 \quad -6 \\ \hline x \geq -27 \end{array}$$

Example 4:

$$\begin{array}{r} 11 < x - 5 \\ +5 \quad +5 \\ \hline 16 < x \\ x > 16 \end{array}$$

## One-Step Inequalities Involving Multiplication & Division

Example 5:

$$\begin{array}{r} 6x \leq -42 \\ \frac{6x}{6} \leq \frac{-42}{6} \\ \hline x \leq -7 \end{array}$$

Example 6:

$$\begin{array}{r} -7x > 63 \\ \frac{-7x}{-7} > \frac{63}{-7} \\ \hline x < -9 \end{array}$$

Flip inequality  
Divide by -

Example 7:

$$\begin{array}{r} 4 \cdot \frac{x}{4} > -6 \cdot 4 \\ \hline x > -24 \end{array}$$

Example 8:

$$\begin{array}{r} -3 \cdot -9 \leq \frac{x}{-3} \cdot -3 \\ \hline 27 \leq x \quad x \geq 27 \end{array}$$

Remember: When multiplying or dividing by a negative, the inequality flips

# Solve & graph.

Example 1:

$$4x + 1 \leq 13$$

$$-1 \quad -1$$

$$\frac{4x}{4} \leq \frac{12}{4}$$

$$x \leq 3$$



Example 2:

$$-9x + 7 \geq 25$$

$$-7 \quad -7$$

$$\frac{-9x}{-9} \geq \frac{18}{-9}$$

$$x \leq -2$$



Example 3:

$$-36 > 6x + 12$$

$$-12 \quad -12$$

$$\frac{-48}{6} > \frac{6x}{6}$$

$$x < -8$$



Example 1:

Graph  $x \leq 3$ .



Example 2:

Graph  $x > -2$ .







Example 3:

Graph  $x \geq 6$ .



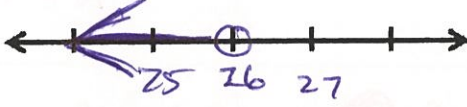
## Graphing Inequalities

$x < 0$			
$x > 0$			
$x \leq 0$			
$x \geq 0$			
$< >$	$\leq \geq$	$< \leq$	$> \geq$

Example 4:

$$\frac{x}{13} - 10 < -8$$


+10    +10

$$13 \cdot \frac{x}{13} < 2 \cdot 13 \quad x < 26$$


Example 5:

$$-18 + \frac{x}{4} \geq -30$$


+18    +18

$$4 \cdot \frac{x}{4} \geq -12 \cdot 4 \quad x \geq -48$$


Example 6:

$$\frac{1}{3} + \frac{x}{18} < \frac{1 \cdot 3 \cdot 3}{2 \cdot 3 \cdot 6}$$

$-\frac{1}{3}$      $-\frac{1}{3} \cdot 2 \cdot \frac{2}{6}$

$$\frac{18}{1} \cdot \frac{x}{18} < \frac{1}{6} \cdot \frac{18}{2} \cdot 3 \quad x < 3$$


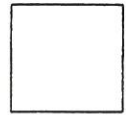
## Solving Two-Step Inequalities

Name: Key

Unit 1: Algebra Basics

Date: \_\_\_\_\_ Bell: \_\_\_\_\_

Homework 11: Solving & Graphing Inequalities



Directions: Solve and graph the following inequalities. SHOW ALL STEPS!

1.  $3x + 1 < 10$

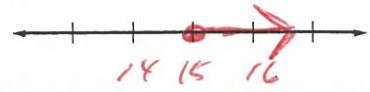
$x < 3$



2.  $\frac{x}{3} + 10 \geq 15$

$\frac{x}{3} \geq 5$

$x \geq 15$



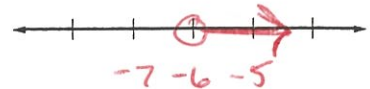
3.  $-2x + 22 < 18$

$-2x < -4$   
 $x > 2$



4.  $7x + 11 > -31$

$7x > -42$   
 $x > -6$



5.  $\frac{x}{5} - 3 \leq 6$

$\frac{x}{5} \leq 9$   
 $x \leq 45$



6.  $18 - 2x > 4$

$-2x > -14$   
 $x < 7$



7.  $\frac{x}{-2} + 1 > 4$

$\frac{x}{-2} > 3$   
 $x < -6$



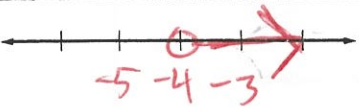
8.  $4 - \frac{x}{7} \leq 5$

$-\frac{x}{7} \leq 1$   
 $x \geq -7$



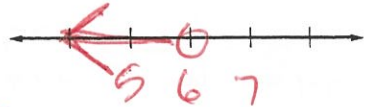
9.  $-3x - 4 < 8$

$-3x < 12$   
 $x > -4$



10.  $2x + 5 < 17$

$2x < 12$   
 $x < 6$



11.  $\frac{5}{8}x - 1 \geq 9$

$\frac{5}{8}x \geq 10$   
 $\frac{5}{8}x \geq \frac{80}{8}$   
 $\frac{5}{8}x \geq \frac{80}{5}$   
 $x \geq \frac{80}{5}$   
 $x \geq 16$



12.  $-\frac{3}{4}x + 2 > 11$

$-\frac{3}{4}x > 9$   
 $-\frac{3}{4}x > \frac{36}{4}$   
 $-\frac{3}{4}x > 9$   
 $x < -12$

