

# Inequalities

**A.REI.3** Solve linear equations and inequalities in one variable including equations with coefficients represented by letters. *For example, given  $ax + 3 = 7$ , solve for  $x$ .*

**What am I learning today?**

How to apply my knowledge of equations to  
inequalities

**How will I show that I learned it?**

Solve and graph the solution set of 1 and 2-step  
inequalities

Word that indicate an inequality:

$>$ greater than more than	$<$ less than
$\geq$ greater than or equal to at least	$\leq$ less than or equal to at most

Solving an Inequality:

Treat just like an equation, but when you multiply  
or divide by a negative,  
SWITCH THE DIRECTION OF THE  
INEQUALITY SIGN.

$$\text{Ex. 1 } \frac{8x}{8} < \frac{40}{8}$$

$$x < 5$$

$$\text{ck: } 8(2) < 40 \\ 16 < 40 \checkmark$$

$$\text{Ex. 2 } x - 5 \geq 20$$

$$\begin{array}{r} x - 5 \geq 20 \\ +5 \quad +5 \\ \hline x \geq 25 \end{array}$$

$$\text{ck: } 25 - 5 \geq 20 \\ 20 \geq 20 \checkmark$$

$$\text{Ex. 3 } \frac{-4x}{-4} \leq \frac{12}{-4}$$

$$x \geq -3$$

ck  $-4(-2) \leq 12$   
 $8 \leq 12$

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

$$x > -9$$

Ex. 5  $5 - x \geq 10$

$$\begin{array}{r} 5 - x \geq 10 \\ -5 \quad -5 \\ \hline \cancel{5} - x \geq \cancel{5} \\ \phantom{5} - x \geq -5 \end{array}$$

$$x \leq -5$$

Ex. 6  $2x + 7 < -3$

$$\begin{array}{r} 2x + 7 < -3 \\ -7 \quad -7 \\ \hline 2x < -10 \\ \frac{2x}{2} < \frac{-10}{2} \end{array}$$

$$x < -5$$

$$\text{Ex. 7 } \cancel{-3} \cdot \left( \frac{x+2}{\cancel{-3}} \right) \leq (4) \cdot \cancel{-3}$$

$$x+2 \geq -12$$

$$\frac{-2}{-2} \quad \frac{-12}{-2}$$

$$\boxed{x \geq -14}$$

$$\text{Ex. 8 } \cancel{2} \left( \frac{8-x}{\cancel{2}} \right) > (-3) \cdot \cancel{2}$$

$$8-x > -6$$

$$\frac{-8}{-8} \quad \frac{-6}{-8}$$

$$\cancel{x} > \frac{-14}{-1}$$

$$x < 14$$

HW:



Pg. 1 - 2

Pg. 2 1. 
$$\begin{array}{r} -12 > x - 7 \\ +7 \quad \quad +7 \end{array}$$

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$$-5 > x$$
$$\boxed{x < -5}$$