

# Algebra 1A

## Lesson 6.2

### Solve Inequalities Using Multiplication and Division

#### Warm-Up

Check whether or not 12 is a solution for each inequality.

(a)  $\frac{x}{3} \leq 7$   
 $4 \leq 7$   
 YES

(b)  $x - 5 > 9$   
 $12 - 5 > 9$   
 $7 > 9$   
 NO

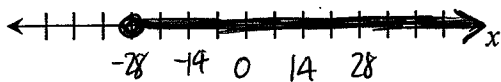
(c)  $2x + 1 < 25$   
 $2(12) + 1 < 25$   
 $25 < 25$   
 NO

(d)  $-x + 6 \geq -8$   
 $-(12) + 6 \geq -8$   
 $-6 \geq -8$   
 YES

#### Example 1. Solve an Inequality Using Multiplication (Assignment #3-26)

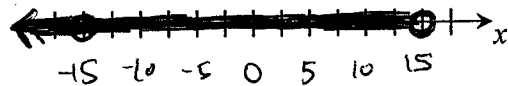
(a) Solve  $\frac{x}{7} \geq -4$ . Graph your solution.

$7 \cdot \frac{x}{7} \geq -4 \cdot 7$   
 $x \geq -28$



(b) Solve  $\frac{x}{3} < 5$ . Graph your solution.

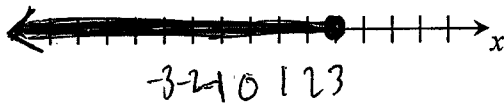
$3 \cdot \frac{x}{3} < 5 \cdot 3$   
 $x < 15$



#### Example 2. Solve an Inequality Using Division (Assignment #3-26)

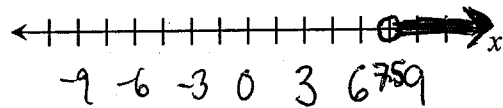
(a) Solve  $6x \leq 18$ . Graph your solution.

$\frac{6x}{6} \leq \frac{18}{6}$   
 $x \leq 3$



(b) Solve  $2x > 15$ . Graph your solution.

$\frac{2x}{2} > \frac{15}{2}$   
 $x > 7.5$

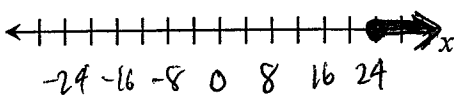


#### Try It!

Solve and graph each inequality.

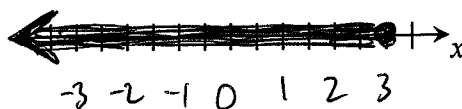
(a)  $\frac{x}{6} \geq 4$

$6 \cdot \frac{x}{6} \geq 4 \cdot 6$   
 $x \geq 24$



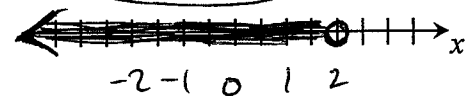
(b)  $\frac{9x}{9} \leq \frac{27}{9}$

$x \leq 3$



(c)  $\frac{x}{4} < \frac{1}{2}$

$4 \cdot \frac{x}{4} < \frac{1}{2} \cdot 4$   
 $x < 2$



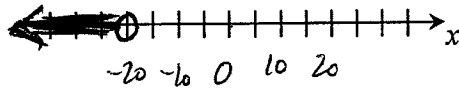
**Example 3. Multiplying or Dividing by a Negative Number (Assignment #3-26)**

Solve each inequality and graph.

(a)  $\frac{x}{-4} > 5$

$-4 \cdot \frac{x}{-4} > 5 \cdot -4$

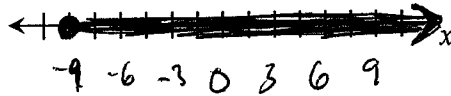
$x < -20$



**If you multiply or divide both sides of an inequality by a negative, you must reverse the direction of the inequality!**

(b)  $\frac{-5x}{-5} \leq \frac{45}{-5}$

$x \geq -9$



**Example 4. Translating Verbal Sentences (Assignment #30-33)**

Write each of the following sentences as an inequality. Then solve the inequality.

(a) The product of -4 and y is less than 32.

(b) The quotient of r and 6 is greater than or equal to -5.

$\frac{-4y}{-4} < \frac{32}{-4}$

$y > -8$

$6 \cdot \frac{r}{6} \geq -5 \cdot 6$

$r \geq -30$

**Example 5. Problem Solving**

You have \$72 left on a gift card to buy music from iTunes. If each CD costs \$9 what are the possible numbers of CDs you could buy?

$\frac{9x}{9} \leq \frac{72}{9}$

$x \leq 8$

You can buy no more than 8 CDs.

**Assignment**

New: Pg. 366 #4-26 (evens), 30-33

**Review:**

Solve the inequalities and graph its solution.

1.  $x + 5 > -4$

2.  $m - 4 < -20$

3.  $3 \geq y - 4$

4.  $\frac{k}{9} \leq 2$

5.  $-\frac{x}{10} < \frac{1}{5}$

6.  $.5 \leq -\frac{b}{6}$