Name ______________________________ Date __________

# 2.3 Notetaking with Vocabulary

***Learning target*: Understand solving liner inequalities.**

*Success criteria*: I can solve one step linear inequalities.

## Core Concepts

### Multiplication and Division Properties of Inequality ($c > 0$)

**Words** Multiplying or dividing each side of an inequality by the same *positive* number produces an equivalent inequality.

**Numbers**

$$-6 < 8 \qquad\qquad 6 > -8$$

$$2 \bullet (-6) < 2 \bullet 8 \qquad\qquad \frac{6}{2} > \frac{-8}{2}$$

$$-12 < 16 \qquad\qquad 3 > -4$$

**Algebra** If $a > b$ and $c > 0$, then $ac > bc$. If $a > b$ and $c > 0$, then $\frac{a}{c} > \frac{b}{c}$.

If $a < b$ and $c > 0$, then $ac < bc$. If $a < b$ and $c > 0$, then $\frac{a}{c} < \frac{b}{c}$.

These properties are also true for $\leq$ and $\geq$.

### Multiplication and Division Properties of Inequality ($c < 0$)

**Words** When multiplying or dividing each side of an inequality by the same *negative* number, the direction of the inequality symbol must be reversed to produce an equivalent inequality.

**Numbers**

$$-6 < 8 \qquad\qquad 6 > -8$$

$$-2 \bullet (-6) > -2 \bullet 8 \qquad\qquad \frac{6}{-2} < \frac{-8}{-2}$$

$$12 > -16 \qquad\qquad -3 < 4$$

**Algebra** If $a > b$ and $c < 0$, then $ac < bc$. If $a > b$ and $c < 0$, then $\frac{a}{c} < \frac{b}{c}$.

If $a < b$ and $c < 0$, then $ac > bc$. If $a < b$ and $c < 0$, then $\frac{a}{c} > \frac{b}{c}$.

These properties are also true for $\leq$ and $\geq$.

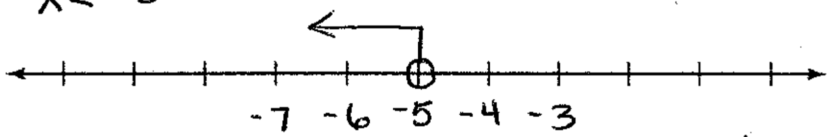
**Notes:**

## Practice

**In Exercises 1–8, solve the inequality. Graph the solution.**

**1.** $\frac{6x}{6} < \frac{-30}{6}$

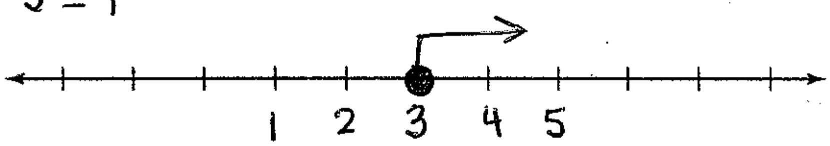
$x < -5$




**2.** $\frac{48}{16} \le \frac{16f}{16}$

$3 \le f$

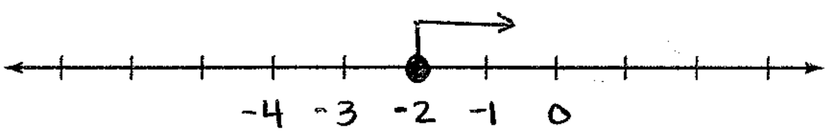
$f \ge 3$




**3.** $-\frac{6}{7} \le \frac{3}{7}f$

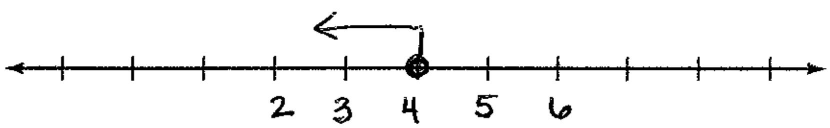
$-2 \le f$

$f \ge -2$



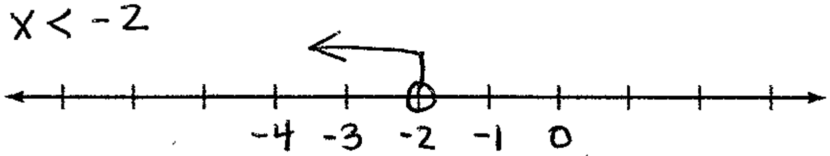

**4.** $\frac{-4m}{-4} \ge \frac{-16}{-4}$

$m \le 4$




**5.** $-6 \cdot \frac{x}{-6} > \frac{1}{3} \cdot -6$

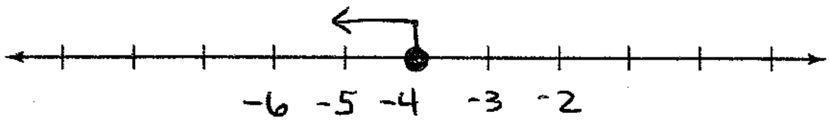
$x < -2$



$\frac{-4}{1} \cdot$ **6.** $\frac{1}{1} \le \frac{\cancel{-1}}{\cancel{4}}y \cdot \frac{\cancel{-4}}{\cancel{1}}$

$-4 \ge y$

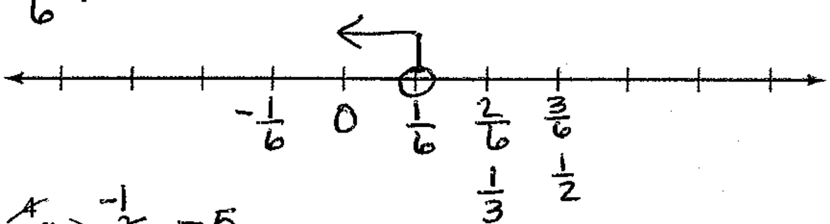
$y \le -4$




$-\frac{1}{4_2} \cdot$ **7.** $\frac{\cancel{2}^{-1}}{3} < \cancel{-4}x \cdot -\frac{1}{\cancel{4}}$

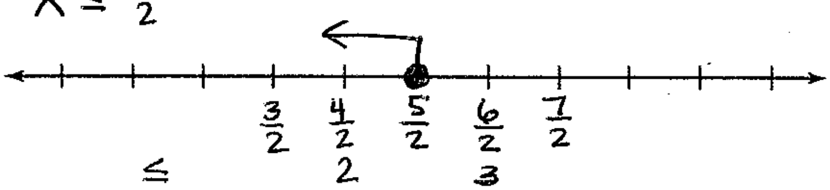
$\frac{1}{6} > x$

$x < \frac{1}{6}$




$-\frac{\cancel{5}}{\cancel{4}} \cdot$ **8.** $\frac{\cancel{4}}{\cancel{5}}x \ge \frac{-\cancel{2}^{1}}{1} \cdot -\frac{5}{\cancel{4}_2}$

$x \le \frac{5}{2}$




$\le$

**9.** There are at most 36 red and blue marbles in a bag. The number of red marbles is twice the number of blue marbles. Write and solve an inequality that represents the ~~greatest~~ number of red marbles *r* in the bag.

r = # of red marbles

b = # of blue marbles

$r = 2b$

$\frac{r}{2} = b$

$r + b \le 36$

$\frac{2r}{2} + \frac{r}{2} \le 36$

$\frac{2}{\cancel{3}} \cdot \frac{\cancel{3}r}{\cancel{2}} \le \frac{\cancel{36}^{12}}{1} \cdot \frac{2}{\cancel{3}_1}$

$r \le 24$