4.3 Solving Inequalities Part 1

Learning Target:

Solve Inequalities using Multiplication and Division

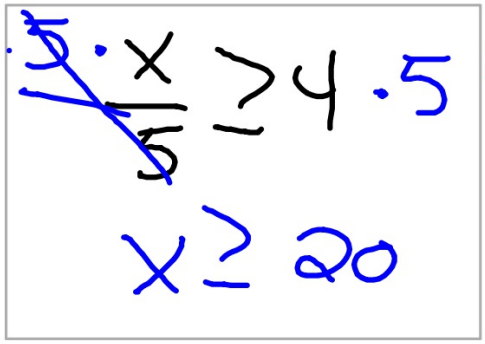
(HINT: Works pretty much like solving Equations!)

"What You Aleady Know"

Multiplication Property of Inequality

$\frac{x}{5} \geq 4$

You can multiply both sides by the same number and it remains true.



"What You Aleady Know"

Division Property of Inequality

$6x < 18$

You can divide both sides by the same number and it remains true.

$\frac{6x}{6} < \frac{18}{6}$

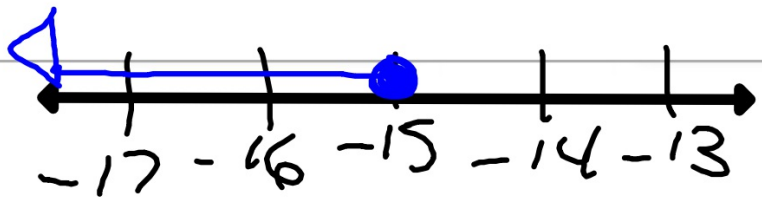
$x < 3$

Solve and Graph

Solve $\frac{x}{5} \leq -3$. Graph the solution.

$5 \cdot \frac{x}{5} \leq -3 \cdot 5$

$x \leq -15$

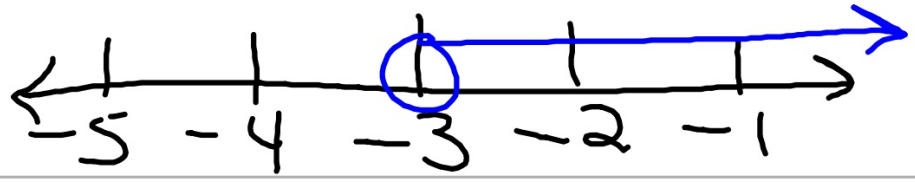


Solve and Graph

Solve $6x > -18$. Graph the solution.

$$\frac{6x}{6} > \frac{-18}{6}$$

$$x > -3$$



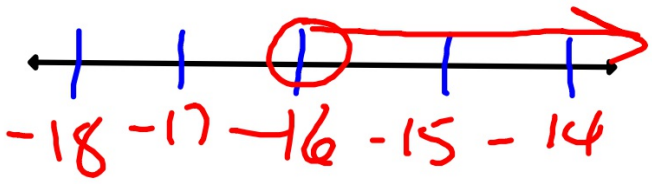
On your own:

Extra Example 1

Solve $\frac{m}{4} > -4$. Graph the solution.

$4 \cdot \frac{m}{4} > -4 \cdot 4$

$m > -16$

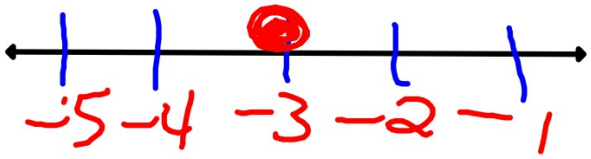


Extra Example 2

Solve $7y \leq -21$. Graph the solution.

$\frac{7y}{7} \leq \frac{-21}{7}$

$y \leq -3$



4.3 Solving Inequalities Part 2

Learning Target:

Solve Inequalities: Multiplying or Dividing by NEGATIVE numbers

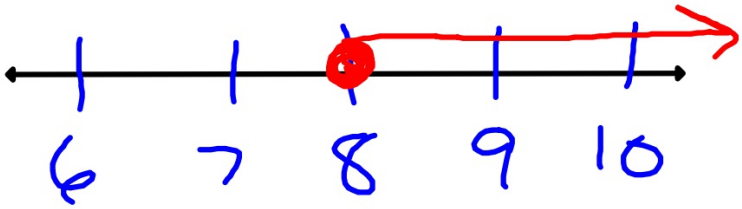
"What's New"

When you multiply or divide both side of an inequality by the same negative number, the inequality symbol MUST be REVERSED for the inequality to remain true.

Solve and Graph

$$\frac{-3m}{-3} \leq \frac{-24}{-3}$$

$m \geq 8$



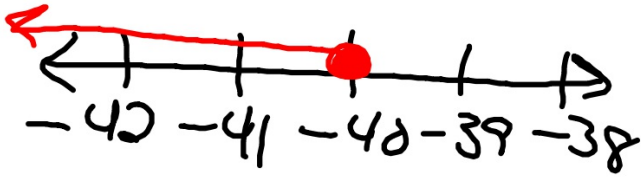
divided by a negative number

$$-\frac{w}{4} \geq 10$$

$$-4\left(-\frac{w}{4}\right) \geq 10(-4)$$

multiplied by a negative number

$$w \leq -40$$



$\frac{6x}{6} < \frac{-12}{6}$

$x < -2$

$\frac{-4x}{-4} < \frac{16}{-4}$

$x > -4$

$3 \cdot \frac{x}{3} \geq -14 \cdot 3$

$x \geq -42$

$-5\left(-\frac{x}{5}\right) \geq (10)(-5)$

$x \leq -50$

Solve and Graph

Solve $-\frac{3}{2}n \leq 6$. Graph the solution.

$$\left(-\frac{2}{3}\right)\left(-\frac{3}{2}n\right) \leq \frac{6}{1}\left(-\frac{2}{3}\right)$$

$$n \geq -4$$

flip the inequality

Solve and Graph

Solve $-3z > -4.5$. Graph the solution.

$\frac{-3z}{-3} \quad \frac{-4.5}{-3}$

$z < 1.5$

flip the inequality

On your own:

Solve the inequality. Graph the solution.

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

Solve the inequality. Graph the solution.

$$-5z < 35$$

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

$$x \leq -18$$

$$18 \geq -4x$$

$$\frac{18}{-4} \quad \frac{\geq -4x}{-4}$$

$$-4.5 \leq x$$

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

$$\left(-\frac{5}{4}\right)-\frac{4}{5}x \geq -8\left(-\frac{5}{4}\right)$$

$$x \geq 10$$