

Algebra 1
5.2 Solve inequalities

negative
 $> \rightarrow <$

Solve inequalities by multiplication and division
Write and solve inequalities

opposite
trichotomy

$=$
 $<$
 $>$

These examples demonstrate the **Multiplication Property of Inequalities**.

KeyConcept Multiplication Property of Inequalities		
Words	Symbols	Examples
If both sides of an inequality that is true are multiplied by a positive number, the resulting inequality is also true.	For any real numbers a and b and any positive real number c , if $a > b$, then $ac > bc$. And, if $a < b$, then $ac < bc$.	$6 > 3.5$ $6(2) > 3.5(2)$ $12 > 7$ and $2.1 < 5$ $2.1(0.5) < 5(0.5)$ $1.05 < 2.5$
If both sides of an inequality that is true are multiplied by a negative number, the direction of the inequality sign is reversed to make the resulting inequality also true.	For any real numbers a and b and any negative real number c , if $a > b$, then $ac < bc$. And, if $a < b$, then $ac > bc$.	$7 > 4.5$ $7(-3) < 4.5(-3)$ $-21 < -13.5$ and $3.1 < 5.2$ $3.1(-4) > 5.2(-4)$ $-12.4 > -20.8$

Whiteboards

Example 2 Solve by Multiplying

Solve $-\frac{3}{7}r < 21$. Graph the solution on a number line.

$$\frac{7}{+3} \cdot \left(\frac{+3}{7}\right) r < \frac{21}{1} \cdot \frac{7}{+3}$$
$$|r > -7$$



r number

Example 3 Divide to Solve an Inequality

Solve each inequality. Graph the solution on a number line.

$$\text{a. } \frac{60t}{60} > \frac{8}{60}$$

$$t > \frac{2}{15}$$

+ number line

$$\text{b. } \frac{-7d}{-7} \leq \frac{147}{-7}$$

$$d \geq -21$$



~~Square puzzle~~

Three options:

$< > =$

Word problems:
"at most"
"at least"
"not more than"
"no less than"

~~$>$~~ =
 \geq

~~$<$~~ ~~$>$~~ = =
 ~~$<$~~ ~~$>$~~ = =
 \leq \geq

Three times a number is at least 108.

$$3n \geq 108$$

$$\cancel{>} =$$

The opposite of four times a number is less than 16.

$$-4n < 16$$

Negative 3 times a number is at most 99.

$$-3 \cdot n \leq 99$$

$$\cancel{<} =$$

$$\begin{array}{ccc} 3 & 3 & 7 \\ 2 & 1 & 5 \end{array}$$

column.

