

Algebra 1

5.2 Solve inequalities

Solve inequalities by multiplication and division

Write and solve inequalities

opposite

trichotomy

activity: triangle puzzles

$$x - \frac{3}{5} \geq 2$$

$$+ \frac{3}{5} \quad + \frac{3}{5}$$

$$x \geq 2 \frac{3}{5}$$

$$x \geq 2.6$$

$$x \geq \frac{13}{5}$$

$$\frac{3n}{3} \geq -\frac{5}{3}$$

$$n \geq -\frac{5}{3}$$

~~$$-1.6666...$$~~

p292

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 $3.1 < 5.2$ $3.1(-4) > 5.2(-4)$ $-12.4 > -20.8$

The DIGITS get bigger as you move away from zero in either direction.

BUT:

Move to the right, the values *increase*.

Move to the left, the values *decrease*.

Example 2 Solve by Multiplying

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

$$\begin{array}{r} \frac{-3}{7}r < 21 \\ \hline -3r < 147 \end{array}$$

$$\begin{array}{r} 21 \\ 21 \\ \hline r > -49 \end{array}$$



Example 3 Divide to Solve an Inequality

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

a. $60t > 8$

b. $-7d \leq 147$

$$\frac{-7d}{-7} \leq \frac{147}{-7}$$

$$d \geq -21$$

Square puzzle

Three options:

Word problems:

"at most"

"at least"

"not more than"

"no less than"

Three times a number is at least 108.

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

Negative 3 times a number is at most 99.

