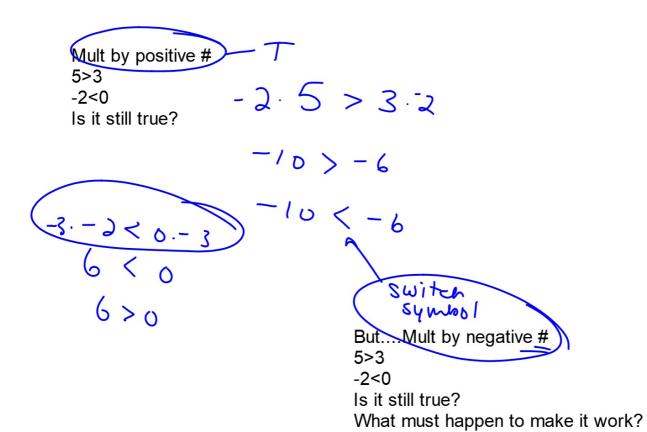
Algebra 1 5.2 *6th grade standard Solve linear inequalities by using multiplication*
Solve linear inequalities by using division*

× = :

multiplication property of (in)equality division property of (in)equality triangle puzzles

Z >



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:

When move to the right, the values *increase*. Move to the left, the values *decrease*.

$$\frac{20}{5} \cdot \frac{1}{5} m \ge -3 \quad = \frac{28}{8} \cdot \frac{3}{8} t < \frac{5}{8} \cdot \frac{8}{3}$$

$$\frac{1}{5} \quad = \frac{3}{8} \cdot \frac{3}{8} t < \frac{5}{8} \cdot \frac{8}{3}$$

$$\frac{5}{8} \quad = \frac{4}{3} \cdot \frac{40}{3}$$

$$m \ge -15$$

Example 2 Solve by Multiplying

Solve $\frac{7}{7}r < 21$. Graph the solution on a number line. $\frac{7}{-\frac{3}{5}}r < \frac{21}{7}$

$$\begin{bmatrix} \frac{1}{-3} & \frac{1}{2} \\ \frac{1}{2} & \frac{3}{2} \end{bmatrix}$$

2A.
$$-\frac{n}{6} \le 8^{-6}$$

2A.
$$-\frac{n}{6} \le 8$$
. $\frac{28}{3} = \frac{4}{3}p > -10$ $\frac{3}{4} = \frac{4}{3}p > -4$ $\frac{-4}{3} = \frac{-4}{3} =$

6>2

40<10

Is it still true?

$$\frac{12}{-2}$$
 > $\frac{6}{-2}$

Divide by negative

12>6

-4<20

Is it still true?

What do we need to do for it to work?

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

Words	Symbols	Examples
If both sides of a true inequality are divided by a positive number, the resulting inequality is also true.	For any real numbers a and b and any positive real number a , if $a > b$, then $\frac{a}{c} > \frac{b}{c}$. And, if $a < b$, then $\frac{a}{c} < \frac{b}{c}$.	4.5 > 2.1
If both sides of a true inequality are divided 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 $\frac{a}{c} < \frac{b}{c}$. And, if $a < b$, then $\frac{a}{c} < \frac{b}{c}$.	$\begin{array}{ccc} 6 > 2.4 & -1.8 < 3.6 \\ \frac{6}{-6} < \frac{2.4}{-6} & \text{and} & \frac{-1.8}{-9} < \frac{3.6}{-9} \\ -1 < -0.4 & 0.2 > -0.4 \end{array}$

Same same...

Example 3 Divide to Solve an Inequality

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

$$\underbrace{\frac{60t}{60}}_{60} > \underbrace{\frac{8}{60}}_{60}$$

$$\begin{array}{c|c}
\hline
\mathbf{0}, & -7d \le 147 \\
\hline
-7 & -7
\end{array}$$

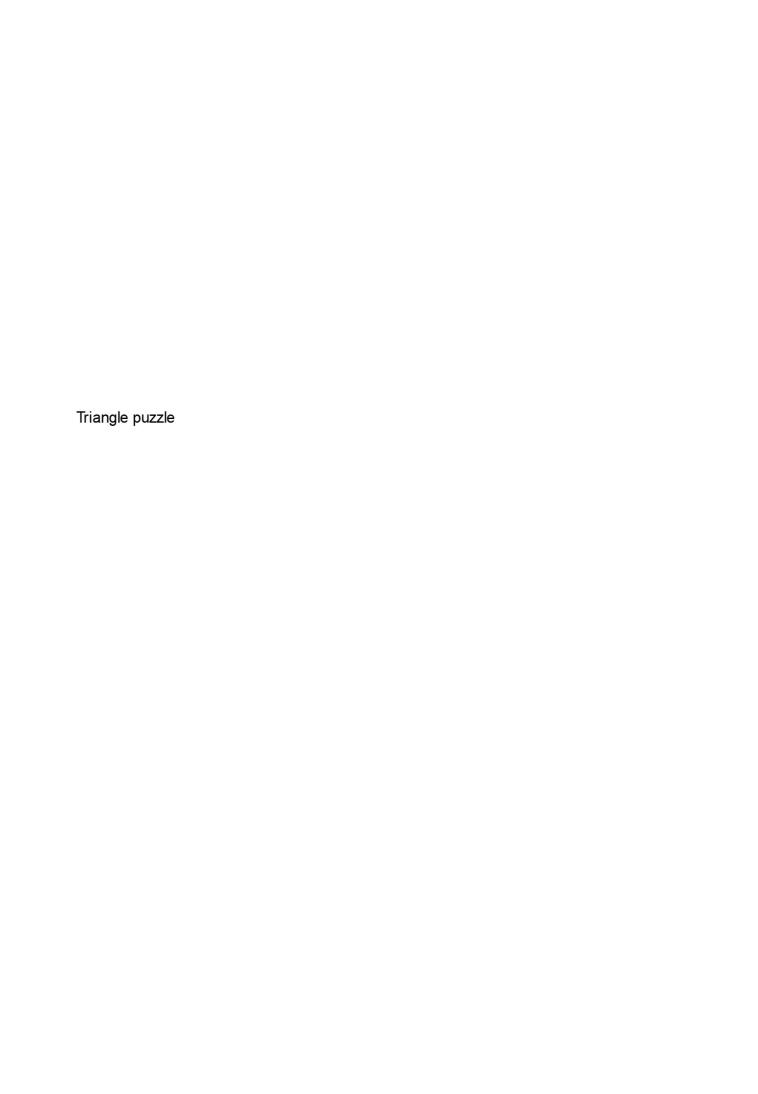
GuidedPractice

3A.
$$8p \le 58$$

3B.
$$-42 \ge 6r$$

3C.
$$-12h > 15$$

3D.
$$-\frac{1}{2}n \le 6$$





Real-World Example 1 Write and Solve an Inequality

SURVEYS Of the students surveyed at Madison High School, fewer than eightyfour said they have never purchased an item online. This is about one eighth of those surveyed. How many students were surveyed?