6.2 Solve Inequalities Using Multiplication and Division

Goal • Solve inequalities using multiplication and division.

Your Notes

MULTIPLICATION PROPERTY OF INEQUALITY

Words Multiplying each side of an inequality by a _____ number produces an _____.

Multiplying each side of an inequality by a _____ number and _____ _____ produces an equivalent inequality.

Algebra If $a < b$ and $c > 0$, then _____.

If $a < b$ and $c < 0$, then _____.

If $a > b$ and $c > 0$, then _____.

If $a > b$ and $c < 0$, then _____.

This property is also true for inequalities involving $\Im$ and $\forall$.

Example 1 *Solve an inequality using multiplication*

Solve $\frac{y}{9} > 3$. Graph your solution.

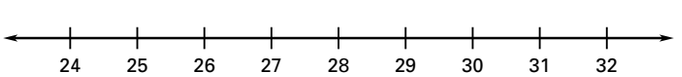
Solution

$\frac{y}{9} > 3$ **Write original inequality.**

___ $\cdot \frac{y}{9} >$ ___ $\cdot 3$ **Multiply each side by ___.**

_____ **Simplify.**

The solutions are all real numbers _____.



Your Notes

Example 2 ***Solve an inequality using multiplication***

Solve $\frac{m}{-2} < 5$. Graph your solution.

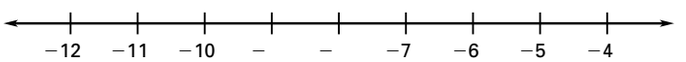
Solution

$\frac{m}{-2} < 5$ — **Write original inequality.**

_____ • $\frac{m}{-2}$ > _____ • 5 — **Multiply each side by _____ and _____ the inequality symbol.**

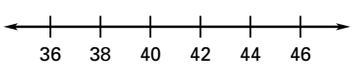
_____ — **Simplify.**

The solutions are all real numbers _____.

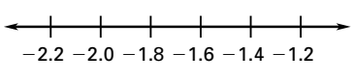


✔ ***Checkpoint*** **Solve the inequality. Graph your solution.**

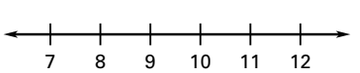
1. $\frac{r}{7} \Im 6$



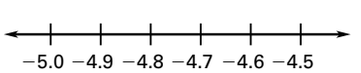
2. $\frac{s}{-4} > 0.4$



3. $\frac{n}{-5} \forall -2$



4. $\frac{w}{6} < -0.8$



Your Notes

DIVISION PROPERTY OF INEQUALITY

Words Dividing each side of an inequality by a _____ number produces an _____.

Dividing each side of an inequality by a _____ number and _____ _____ produces an equivalent inequality.

Algebra If $a < b$ and $c > 0$, then _____.

If $a < b$ and $c < 0$, then _____.

If $a > b$ and $c > 0$, then _____.

If $a > b$ and $c < 0$, then _____.

This property is also true for inequalities involving $\Im$ and $\forall$.

Example 3 ***Solve an inequality using division***

Solve $-4x < 36$. Graph your solution.

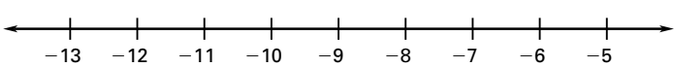
Solution

$-4x < 36$ **Write original inequality.**

$\frac{-4x}{\square} > \frac{36}{\square}$ **Divide each side by _____ and _____ the inequality symbol.**

_____ **Simplify.**

The solutions are all real numbers _____.



Your Notes

Example 4 ***Solve a real-world problem***

Pizza Party You have a budget of $45 to buy pizza for a student council meeting. Pizzas cost $7.50 each. Write and solve an inequality to find the possible numbers of pizzas that you can buy.

Solution

Price per pizza (dollars per pizza)	•	Number of pizzas (pizzas)	≤	Budget amount (dollars)
_____	•	p	≤	____

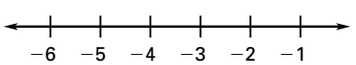
_____ **Write inequality.**

$p \leq$ ___ **Divide each side by** _____.

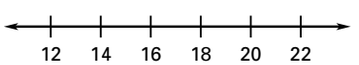
You can buy at most ___ pizzas.

✔ ***Checkpoint*** **Solve the inequality. Graph your solution.**

5. $-9k < 36$



6. $10n \geq 140$



7. In Example 4, suppose that you had a budget of $50 and each pizza costs $8. Write and solve an inequality to find the possible numbers of pizzas that you can buy.

Homework