

Solve the equation.

$$1. \frac{6g}{6} = \frac{18}{6}$$

$$g = 3$$

$$2. p \div 6 = 2 \cdot 6$$

$$p = 12$$

$$3. \frac{-7r}{-7} = \frac{63}{-7}$$

$$r = -9$$

$$4. \frac{x}{7} = 9 \cdot 7$$

$$x = 63$$

$$5. \frac{-56}{8} = \frac{8s}{8}$$

$$s = -7$$

$$6. \frac{5q}{5} = \frac{50}{5}$$

$$q = 10$$

Simplify the expression.

1. $|-8|$

2. $|13| + |-13|$

3. $|-6 \div (-6)|$

4. $\left| \frac{26}{-2} \right|$

Simplify the expression.

5. $|14|$

6. $2 - |2|$

7. $|-7.7 \div 11|$

8. $-\left|\frac{-10}{5}\right|$

Essential Question

How can you use division to solve an inequality?

Work with a partner.

a. Copy and complete the table. Decide which graph represents the solution of the inequality $6 < 3x$. Write the solution of the inequality.

x	-1	0	1	2	3	4	5
$3x$	-3						
$6 < 3x$	No						



b. Use a table to solve each inequality. Then write a rule that describes how to use division to solve the inequalities.

i. $2x < 4$

ii. $3 \geq 3x$

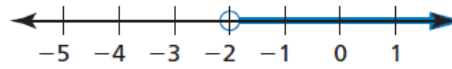
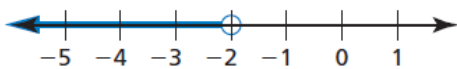
iii. $2x < 8$

iv. $6 \geq 3x$

Work with a partner.

a. Copy and complete the table. Decide which graph represents the solution of the inequality $6 < -3x$. Write the solution of the inequality.

x	-5	-4	-3	-2	-1	0	1
$-3x$							
$6 < -3x$							



b. Use a table to solve each inequality. Then write a rule that describes how to use division to solve the inequalities.

i. $-2x < 4$

ii. $3 \geq -3x$

iii. $-2x < 8$

iv. $6 \geq -3x$

Core Concept

Multiplication and Division Properties of Inequality ($c > 0$)

Words Multiplying or dividing each side of an inequality by the same *positive* number produces an equivalent inequality.

Numbers

$-6 < 8$	$6 > -8$
$2 \cdot (-6) < 2 \cdot 8$	$\frac{6}{2} > \frac{-8}{2}$
$-12 < 16$	$3 > -4$

Algebra If $a > b$ and $c > 0$, then $ac > bc$. If $a > b$ and $c > 0$, then $\frac{a}{c} > \frac{b}{c}$.

If $a < b$ and $c > 0$, then $ac < bc$. If $a < b$ and $c > 0$, then $\frac{a}{c} < \frac{b}{c}$.

These properties are also true for \leq and \geq .

Solve (a) $\frac{x}{8} > -5$ and (b) $-24 \geq 3x$. Graph each solution.

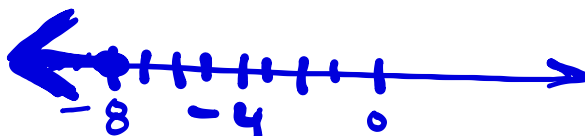
A. $\frac{x}{8} > -5 \cdot 8$

$x > -40$



B. $\frac{-24}{3} \geq \frac{3x}{3}$

$-8 \geq x$



Solve the inequality. Graph the solution.

1. $\frac{n}{7} \geq -1$

2. $-6.4 \geq -15w$

3. $4b \geq 36$

4. $-18 > 1.5q$

Core Concept

Multiplication and Division Properties of Inequality ($c < 0$)

Words When multiplying or dividing each side of an inequality by the same *negative* number, the direction of the inequality symbol must be reversed to produce an equivalent inequality.

Numbers

$$\begin{array}{rcl} -6 < 8 & & 6 > -8 \\ -2 \cdot (-6) > -2 \cdot 8 & & \frac{6}{-2} < \frac{-8}{-2} \\ 12 > -16 & & -3 < 4 \end{array}$$

Algebra If $a > b$ and $c < 0$, then $ac < bc$. If $a > b$ and $c < 0$, then $\frac{a}{c} < \frac{b}{c}$.

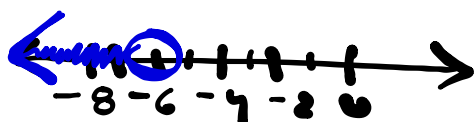
If $a < b$ and $c < 0$, then $ac > bc$. If $a < b$ and $c < 0$, then $\frac{a}{c} > \frac{b}{c}$.

These properties are also true for \leq and \geq .

Solve each inequality. Graph each solution.

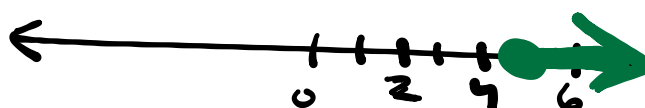
a. $\frac{y}{-3} < -3$

$-6 > y$



b. $\frac{-7y}{-7} \leq \frac{-35}{-7}$

$y \geq 5$



Solve the inequality. Graph the solution.

$$5. \frac{p}{-4} < 7 \cdot -4$$

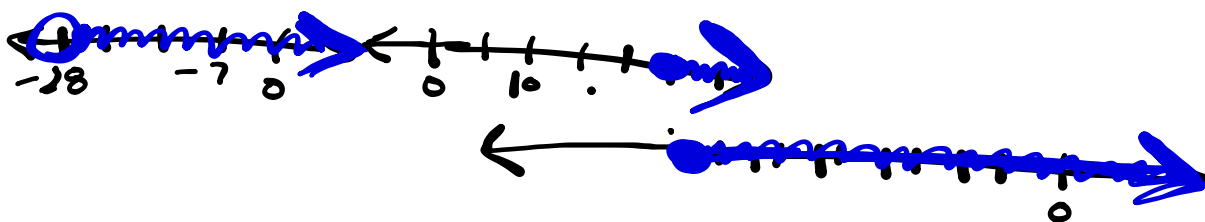
$$p > -28$$

$$6. \frac{x}{-5} \leq -5 \cdot 5$$

$$x \geq 25$$

$$7. 1 \geq -\frac{1}{10}z \cdot -\frac{10}{1}$$

$$-10 \leq z$$



8. $-9m > 63$

9. $-2r \geq -22$

10. $-0.4y \geq -12$

You earn \$9.50 per hour at your summer job. Write and solve an inequality that represents the numbers of hours you need to work to buy a digital camera that costs \$247.

Earn \$9.50/hr h : hours worked
Camera = \$247

$$\frac{9.50h}{9.50} \geq \frac{247}{9.50}$$

$$h \geq 26$$

11. You have at most \$3.65 to make copies. Each copy costs \$0.25. Write and solve an inequality that represents the numbers of copies you can make.

12. The maximum speed limit for a school bus is 55 miles per hour. Write and solve an inequality that represents the numbers of hours it takes to travel 165 miles in a school bus.

Exit Ticket: Solve and graph.

$$\frac{x}{-3} \leq -9$$

$$-8 > 4x$$