

Solving Inequalities with Multiplication and Division

POSITIVE

$$\frac{10}{2} > \frac{6}{2}$$

$$5 > 3$$

$$(3)5 > 4(3)$$

$$15 > 12$$

$$\frac{15}{5} < \frac{20}{5}$$

$$3 < 4$$

$$(1)7 < 9(1)$$

$$7 < 9$$

NEGATIVE

$$\frac{10}{-2} > \frac{6}{-2}$$

$$-5 < -3$$

$$(-3)5 > 4(-3)$$

$$-15 < -12$$

$$\frac{-15}{-5} > \frac{-20}{-5}$$

$$3 < 4$$

$$(-1)-7 > -9(-1)$$

$$-7 < 9$$

Lesson 7 Reteach

Solve Inequalities by Multiplication or Division

When you multiply or divide each side of an inequality by a positive number, the inequality remains true. However, when you multiply or divide each side of an inequality by a negative number, the direction of the inequality must be reversed for the inequality to remain true.

Example 1

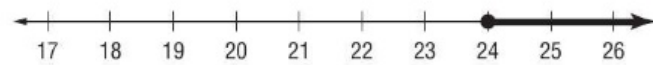
Solve $\frac{t}{-6} \leq -4$. Then graph the solution set on a number line.

$$\frac{t}{-6} \leq -4 \quad \text{Write the inequality.}$$

$$\frac{t}{-6}(-6) \geq -4(-6) \quad \text{Multiply each side by } -6 \text{ and reverse the inequality symbol.}$$

$$t \geq 24 \quad \text{Simplify.}$$

To graph the solution, place a closed circle at 24 and draw a line and arrow to the right.



Example 2

Solve $\frac{4}{5}x - 5 < 23$.

$$\frac{4}{5}x - 5 < 23 \quad \text{Write the inequality.}$$

$$\frac{4}{5}x - 5 + 5 < 23 + 5 \quad \text{Add 5 to each side.}$$

$$\frac{4}{5}x < 28 \quad \text{Simplify.}$$

$$\left(\frac{5}{4}\right)\frac{4}{5}x < \left(\frac{5}{4}\right)28 \quad \text{Multiply each side by } \frac{5}{4}.$$

$$x < 35 \quad \text{Simplify.}$$

1. $\frac{3a > 12}{3} \quad \frac{a > 4}{3}$

CHECK
 $3(5) > 12$
 $15 > 12$

2. $(-2)6 \geq \frac{r}{-2} \left(\frac{-2}{-2}\right)$
 $-12 \leq r$
 $-12 \leq -10$
 $6 \geq \frac{-11}{-2}$
 $6 \geq \frac{-10}{-2}$
 $6 \geq 5$

$3 < 5$
 $5 > 3$

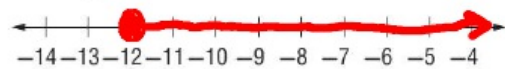
Exercises

Solve each inequality. Then graph the solution on a number line.

1. $3a > 12$



2. $6 \geq \frac{r}{-2}$



Solve each inequality. Check your solution.

3. $-3.1c + 2 \geq 2$ $-3.1c + 2 \geq 2$
 $\quad \quad \quad -2 \quad \quad -2$

4. $13 > -\frac{2}{3}y - 3$

5. $-\frac{h}{5} - 6 < -10$

5. $-\frac{h}{5} - 6 < -10$ $-\frac{h}{5} - 6 < -10$
 $\quad \quad \quad -3.1 \quad \geq 0$
 $\quad \quad \quad \quad \quad -3.1$
 $\quad \quad \quad c \geq 0$

6. $6a + 13 \leq 31$

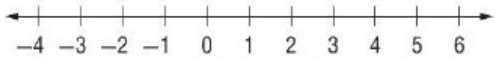
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Lesson 7 Skills Practice

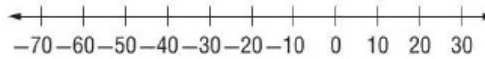
Solve Inequalities by Multiplication or Division

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

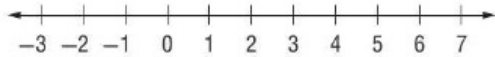
1. $3v > 12$



2. $\frac{p}{4} < -15$



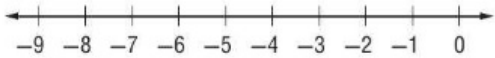
3. $-12 \leq -3g$



4. $60 \geq 12c$



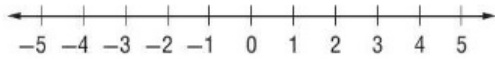
5. $\frac{a}{2} > -4$



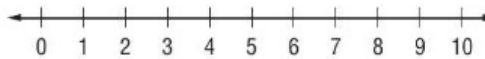
6. $1 \leq \frac{u}{5}$



7. $-14 \geq 7n$



8. $-4d \geq -36$



Solve each inequality. Check your solution.

9. $3a + 6 < -10$

10. $\frac{b}{5} - 4 \geq -29$

11. $\frac{m}{2} + 6 < 10$

12. $\frac{2}{3} + \frac{1}{6}r > -1$

13. $-6d + 7 \leq 1$

14. $\frac{z}{-8} - 5 < -3$

15. $-2y - 5 \leq 31$

16. $2.1n \leq -4.6n + 13.4$

17. $3x + 2 < x - 6$

18. $y - 3 > 2y - 7$

19. $\frac{a}{4} + 5 < a - 4$

20. $1.5g - 12 > \frac{3g}{4}$