

Lesson 7 - Solve Inequalities by Multiplication or Division

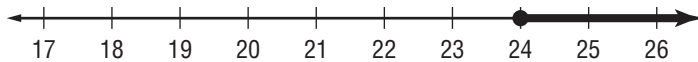
When you multiply or divide each side of an inequality by a positive number, the inequality remains true. However, when you multiply or divide each side of an inequality by a negative number, the direction of the inequality must be reversed for the inequality to remain true.

Example 1

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

$$\begin{aligned} \frac{t}{-6} &\leq -4 && \text{Write the inequality.} \\ \frac{t}{-6}(-6) &\geq -4(-6) && \text{Multiply each side by } -6 \text{ and reverse the inequality symbol.} \\ t &\geq 24 && \text{Simplify.} \end{aligned}$$

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



Example 2

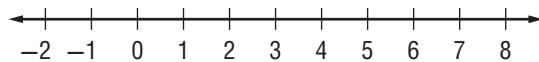
Solve $\frac{4}{5}x - 5 < 23$.

$$\begin{aligned} \frac{4}{5}x - 5 &< 23 && \text{Write the inequality.} \\ \frac{4}{5}x - 5 + 5 &< 23 + 5 && \text{Add 5 to each side.} \\ \frac{4}{5}x &< 28 && \text{Simplify.} \\ \left(\frac{5}{4}\right)\frac{4}{5}x &< \left(\frac{5}{4}\right)28 && \text{Multiply each side by } \frac{5}{4}. \\ x &< 35 && \text{Simplify.} \end{aligned}$$

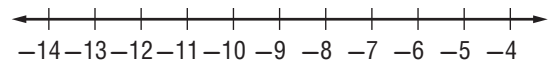
Exercises

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. $-3.1c + 2 \geq 2$

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

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

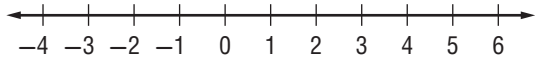
6. $6a + 13 \leq 31$

Lesson 7 Skills Practice

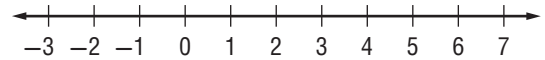
Solve Inequalities by Multiplication or Division

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

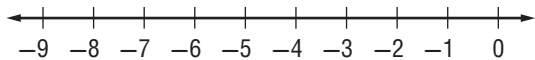
1. $3v > 12$



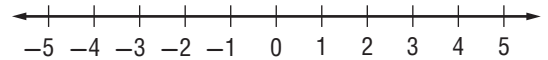
3. $-12 \leq -3g$



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



7. $-14 \geq 7n$



Solve each inequality. Check your solution.

9. $3a + 6 < -10$

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

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

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

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

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