Lesson 6-7 - 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 $\frac{t}{-6} \le -4$. Then graph the solution set on a number line.

$\frac{t}{-6} \le -4$ Write the inequality.

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

$t \ge 24$ Simplify.

To graph the solution, place a closed circle at 24 and draw a line and arrow to the right.
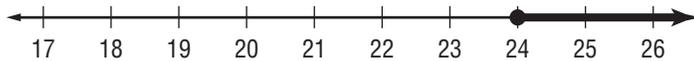
Example 2

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

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

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

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

$\left(\frac{5}{4}\right)\frac{4}{5}x < \left(\frac{5}{4}\right)28$ Multiply each side by $\frac{5}{4}$.
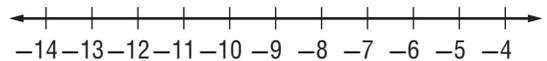
$x < 35$ Simplify.

Exercises

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

1. $3a > 12$

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

Solve each inequality. Check your solution.

3. $-3.1c + 2 \ge 2$

4. $13 > -\frac{2}{3}y - 3$
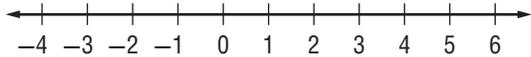
5. $-\frac{h}{5} - 6 < -10$

6. $6a + 13 \le 31$
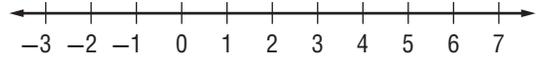
Lesson 7 Skills Practice

Solve Inequalities by Multiplication or Division
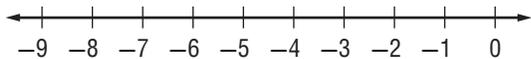
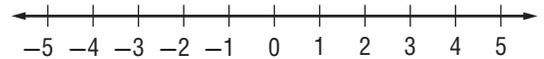**Solve each inequality. Graph the solution set on a number line.**

1. $3v > 12$

3. $-12 \leq -3g$

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 ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
−4 −3 −2 −1  0  1  2  3  4  5  6
```

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 ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
−3 −2 −1  0  1  2  3  4  5  6  7
```

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

7. $-14 \geq 7n$

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 ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
−9 −8 −7 −6 −5 −4 −3 −2 −1  0
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 ├──┼──┼──┼──┼──┼──┼──┼──┼──┼──┤
−5 −4 −3 −2 −1  0  1  2  3  4  5
```

Solve each inequality. Check your solution.

9. $3a + 6 < -10$

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

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

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

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

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