Solve Inequalities by Multiplication or Division

$\left(\frac{5}{1}\right)\frac{x}{5} > 4(5)$

$x > 20$

$\frac{25}{5} \stackrel{?}{>} 4$

$5 > 4$

:)

$\left(\frac{5}{1}\right)\frac{x}{5} \geq 4(5)$

$x \geq 20$

$\frac{20}{5} \stackrel{?}{=} 4$

$4 = 4$

:)

$\frac{3x}{3} < \frac{12}{3}$

$x < 4$

$3(2) \stackrel{?}{<} 12$

$6 < 12$

:)

$\frac{3x}{3} = \frac{12}{3}$

$x = 4$

$3(4) \stackrel{?}{=} 12$

$12 = 12$

:)

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$4 > 3$

$2 \cdot 4 > 3 \cdot 2$

$8 > 6$

$(-2)4 > 3(-2)$

$-8 < -6$

$\frac{10}{-5} < \frac{15}{-5}$

$-2 > -3$

NAME _____ DATE _____ PERIOD _____

Lesson 6-7 - Solve Inequalities by Multiplication or Division

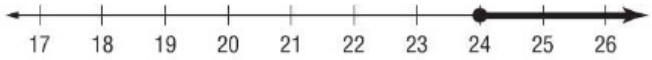
When you multiply or divide each side of an inequality by a positive number, the inequality remains true. However, when you multiply or divide each side of an inequality by a negative number, the direction of the inequality must be reversed for the inequality to remain true.

Example 1

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

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

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



Example 2

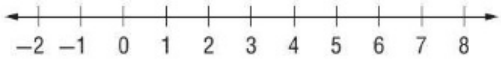
Solve $\frac{4}{5}x - 5 < 23$.

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

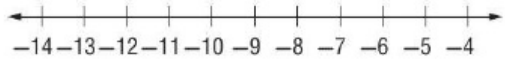
Exercises

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

1. $3a > 12$



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



Solve each inequality. Check your solution.

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

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

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

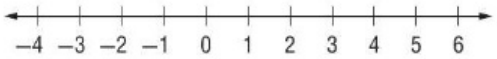
6. $6a + 13 \leq 31$

Lesson 7 Skills Practice

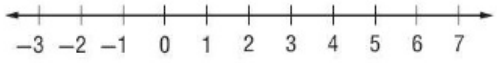
Solve Inequalities by Multiplication or Division

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

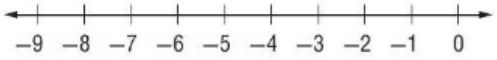
1. $3v > 12$



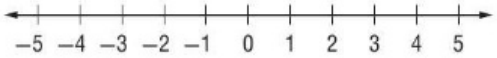
3. $-12 \leq -3g$



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. $y - 3 > 2y - 7$