

# Solving Multi-Step Inequalities Bell Work

Solve each inequality.

1.  $6x - 1 \leq -19$

2.  $-6y + 12 \geq -6$

3.  $\frac{x}{7} - 12 > -5$

4.  $13 - a < 5$

5.  $-16 > 3a + 2$

6.  $\frac{y}{4} - 26 > -12$

7.  $3x + 4 < 2(x + 3) - x$

8.  $5(x - 3) - 7(2x + 9) > 4x$

9.  $5x + 3.4 < -9x - 2.2$

10.  $-\frac{3x}{5} + 7 \leq -5$

Write, solve and graph each inequality.

11. Three times the sum of a number and seven is greater than five times the number less thirteen.



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## ANSWER

Solve each inequality.

1.  $6x - 1 \leq -19$

$$\begin{aligned}
 6x - 1 + 1 &\leq -19 + 1 \\
 6x &\leq -18 \\
 \frac{6x}{6} &\leq \frac{-18}{6} \\
 x &\leq -3
 \end{aligned}$$

2.  $-6y + 12 \geq -6$

$$\begin{aligned}
 -6y + 12 - 12 &\geq -6 - 12 \\
 -6y &\geq -18 \\
 \frac{-6y}{-6} &\leq \frac{-18}{-6} \\
 y &\leq 3
 \end{aligned}$$

3.  $\frac{x}{7} - 12 > -5$

$$\begin{aligned}
 \frac{x}{7} - 12 + 12 &> -5 + 12 \\
 \frac{x}{7} &> 7 \\
 \frac{x}{7}(7) &> 7(7) \\
 x &> 49
 \end{aligned}$$

4.  $13 - a < 5$

$$\begin{aligned}
 13 - 13 - a &< 5 - 13 \\
 -a &< 8 \\
 \frac{-a}{-1} &< \frac{8}{-1} \\
 a &< -8
 \end{aligned}$$

5.  $-16 > 3a + 2$

$$\begin{aligned}
 -16 - 2 &> 3a + 2 - 2 \\
 -18 &> 3a \\
 \frac{-18}{3} &> \frac{3a}{3} \\
 -6 &> a
 \end{aligned}$$

6.  $\frac{y}{4} - 26 > -12$

$$\begin{aligned}
 \frac{y}{4} - 26 + 26 &> -12 + 26 \\
 \frac{y}{4} &> 14 \\
 \frac{y}{4}(4) &> 14(4) \\
 y &> 56
 \end{aligned}$$

7.  $3x + 4 < 2(x + 3) - x$

$$\begin{aligned}
 3x + 4 &< 2x + 6 - x \\
 3x + 4 &< x + 6 \\
 3x - x + 4 &< x - x + 6 \\
 2x + 4 &< 6 \\
 2x + 4 - 4 &< 6 - 4 \\
 2x &< 2 \\
 \frac{2x}{2} &< \frac{2}{2} \\
 x &< 1
 \end{aligned}$$

8.  $5(x - 3) - 7(2x + 9) > 4x$

$$\begin{aligned}
 5x - 15 - 14x - 63 &> 4x \\
 -9x + 9x - 78 &> 4x + 9x \\
 -78 &> 13x \\
 \frac{-78}{13} &> \frac{13x}{13} \\
 -6 &> x
 \end{aligned}$$

9.  $5x + 3.4 < -9x - 2.2$

$$\begin{aligned}
 5x + 9x + 3.4 &< -9x + 9x - 2.2 \\
 14x + 3.4 &< -2.2 \\
 14x + 3.4 - 3.4 &< -2.2 - 3.4 \\
 14x &< -5.6 \\
 \frac{14x}{14} &< \frac{-5.6}{14} \\
 x &< -0.4
 \end{aligned}$$

10.  $-\frac{3x}{5} + 7 \leq -5$

$$\begin{aligned}
 -\frac{3x}{5} + 7 - 7 &\leq -5 - 7 \\
 -\frac{3x}{5} &\leq -12 \\
 \left(-\frac{5}{3}\right)\left(-\frac{3x}{5}\right) &\leq -12\left(-\frac{5}{3}\right) \\
 x &\leq 20
 \end{aligned}$$

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Write, solve and graph each inequality.

11. Three times the sum of a number and seven is greater than five times the number less thirteen.



$$3(x + 7) > 5x - 13$$

$$3x + 21 > 5x - 13$$

$$3x + 21 + 13 > 5x - 13 + 13$$

$$3x + 34 > 5x$$

$$3x - 3x + 34 > 5x - 3x$$

$$34 > 2x$$

$$\frac{34}{2} > \frac{2x}{2}$$

$$17 > x$$