

Solving Multi Step Linear Inequalities

Unit 2: Equations and Inequalities

Solve each equation:

<p>1. $20 < -7n + 2n$</p> $\frac{20}{-5} < \frac{-5n}{-5}$ $\boxed{-4 > n} \quad \text{or} \quad \boxed{n < -4}$	<p>2. $1 - 8x - 6x \leq -13$</p> $\frac{1 - 14x}{-1} \leq \frac{-13}{-1}$ $\frac{-14x}{-14} \leq \frac{-14}{-14}$ $\boxed{x \geq 1}$
<p>3. $9 - 7n \leq 1 - 3n$</p> $\frac{9 - 7n}{+7n} \leq \frac{1 - 3n}{+7n}$ $\frac{9}{-1} \leq \frac{1 + 4n}{-1}$ $\frac{8}{4} \leq \frac{4n}{4}$ $\boxed{2 \leq n}$ <p style="text-align: center;">or</p> $\boxed{n \geq 2}$	<p>4. $1 - n > 5 - 3n$</p> $\frac{1 - n}{+3n} > \frac{5 - 3n}{+3n}$ $\frac{1 + 2n}{-1} > \frac{5}{-1}$ $\frac{2n}{2} > \frac{4}{2}$ $\boxed{n > 2}$
<p>5. $6(7n - 1) \geq 246$</p> $\frac{7n - 1}{+1} \geq \frac{41}{+1}$ $\frac{7n}{7} \geq \frac{42}{7}$ $\boxed{n \geq 6}$	<p>6. $5 - 6(1 + 5r) > 119$</p> $\frac{-6(1 + 5r)}{-6} > \frac{114}{-6}$ $\frac{1 + 5r}{-1} < \frac{-19}{-1}$ $\frac{5r}{5} < \frac{-20}{5}$ $\boxed{r < -4}$
<p>7. $250 \geq 5(8 + 7n)$</p> $\frac{50}{-8} \geq \frac{8 + 7n}{-8}$ $\frac{42}{7} \geq \frac{7n}{7}$ $\boxed{6 \geq n}$ <p style="text-align: center;">or</p> $\boxed{n \leq 6}$	<p>8. $-260 \geq -5(7x + 3)$</p> $\frac{52}{-3} \leq \frac{7x + 3}{-3}$ $\frac{49}{7} \leq \frac{7x}{7}$ $\boxed{7 \leq x}$ <p style="text-align: center;">or</p> $\boxed{x \geq 7}$
<p>9. $5(x - 5) \geq 4x - 30$</p> $\frac{5x - 25}{-4x} \geq \frac{4x - 30}{-4x}$ $\frac{x - 25}{+25} \geq \frac{-30}{+25}$ $\boxed{x \geq -5}$	<p>10. $36 - 6x < -3 - (1 + x)$</p> $\frac{36 - 6x}{+4 + 6x} < \frac{-4 - x}{+4 + 6x}$ $\frac{40}{5} < \frac{5x}{5}$ $\boxed{8 < x}$ <p style="text-align: center;">or</p> $\boxed{x > 8}$

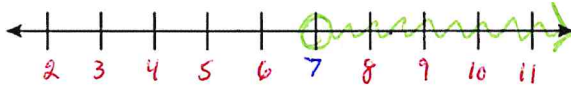
$$11. -5(-3x + 3) > 34 + 8x$$

$$\begin{array}{r} 15x - 15 > 34 + 8x \\ -8x \quad -8x \end{array}$$

$$x > 7$$

$$\begin{array}{r} 7x - 15 > 34 \\ +15 \quad +15 \end{array}$$

$$\frac{7x}{7} > \frac{49}{7}$$



$$12. -3(n - 2) \leq -15 - 6n$$

$$\begin{array}{r} -3n + 6 \leq -15 - 6n \\ +6n \quad -6 \quad -6 \quad +6n \end{array}$$

$$\frac{3n}{3} \leq \frac{-21}{3}$$

$$n \leq -7$$



$$13. -(1 - 8n) - 7(7n + 7) \leq 73$$

$$\begin{array}{r} -1 + 8n - 49n - 49 \leq 73 \\ -41n - 50 \leq 73 \\ +50 \quad +50 \end{array}$$

$$n \geq -3$$

$$\begin{array}{r} -41n - 50 \leq 73 \\ +50 \quad +50 \end{array}$$

$$\frac{-41n}{-41} \leq \frac{123}{-41}$$



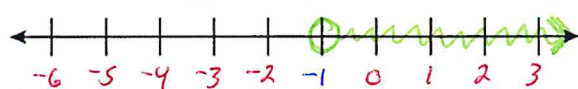
$$14. -5(2x + 2) - 5(1 + 7x) < 30$$

$$\begin{array}{r} -10x - 10 - 5 - 35x < 30 \\ -45x - 15 < 30 \\ +15 \quad +15 \end{array}$$

$$x > -1$$

$$\begin{array}{r} -45x - 15 < 30 \\ +15 \quad +15 \end{array}$$

$$\frac{-45x}{-45} < \frac{45}{-45}$$



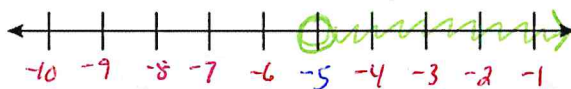
$$15. 72 > 5(-3x - 3) - 2(x - 1)$$

$$\begin{array}{r} 72 > -15x - 15 - 2x + 2 \\ -17x - 13 > -70 \\ +13 \quad +13 \end{array}$$

$$\frac{-17x}{-17} > \frac{-70}{-17}$$

$$-5 < x \text{ OR}$$

$$x > -5$$



$$16. -6(8 - x) - 6(x + 8) > -96$$

$$\begin{array}{r} -48 + 6x - 6x - 48 > -96 \\ -96 > -96 \end{array}$$

$$-96 > -96$$

False statement **NO SOLUTION**



$$17. -6(a + 4) > -4(a - 2)$$

$$\begin{array}{r} -6a - 24 > -4a + 8 \\ +6a \quad +6a \end{array}$$

$$-16 > a$$

OR

$$a < -16$$

$$\begin{array}{r} -24 > 2a + 8 \\ -8 \quad -8 \end{array}$$

$$\frac{-32}{2} > \frac{2a}{2}$$

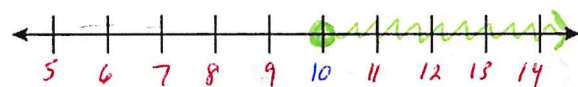


$$18. -7b - 7(-2b + 7) \geq 4(b - 3) - 7$$

$$\begin{array}{r} -7b + 14b - 49 \geq 4b - 12 - 7 \\ 7b - 49 \geq 4b - 19 \\ -4b + 49 \quad -4b + 49 \end{array}$$

$$\frac{3b}{3} \geq \frac{30}{3}$$

$$b \geq 10$$



$$19. 1 + 3(-3b + 6) < -2 - 3(b - 1)$$

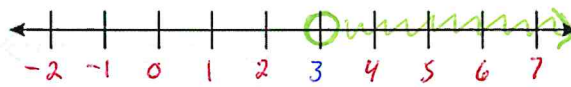
$$\begin{array}{r} 1 - 9b + 18 < -2 - 3b + 3 \\ 19 - 9b < 1 - 3b \\ -1 + 9b \quad -1 + 9b \end{array}$$

$$3 < b \text{ OR}$$

$$b > 3$$

$$\begin{array}{r} 19 - 9b < 1 - 3b \\ -1 + 9b \quad -1 + 9b \end{array}$$

$$\frac{18}{6} < \frac{6b}{6}$$



$$20. -4(n - 3) \leq 2(-3n - 6)$$

$$\begin{array}{r} -4n + 12 \leq -6n - 12 \\ +6n - 12 \quad +6n - 12 \end{array}$$

$$\frac{2n}{2} \leq \frac{-24}{2}$$

$$n \leq -12$$

