Chapter 6. Solving Linear Inequalities

Answer 1PT.

The objective is to write the inequality for the given sentence.

Consider the number as *t*, *t* is greater than or equal to 17.

This can be expressed as following inequality

$$t \geq 17$$

In the set builder notation it is represented as $\boxed{\{t \mid t \geq 17\}}$.

Answer 1STP.

The objective is to find the correct statement.

(a) Consider the following inequality

$$\frac{-9}{3} > \frac{3}{9}$$

Simplify the inequality by multiplying both sides with 3.

$$\frac{-9}{3} > \frac{3}{9}$$

$$\frac{-9}{\cancel{3}} \times \cancel{3} > \frac{\cancel{3}}{\underset{3}{\cancel{9}}} \times \cancel{3} \quad \text{False}$$

$$-9 \not> 1$$

(b) Consider the following inequality

$$-\frac{3}{9} > -\frac{9}{3}$$

Simplify the inequality by multiplying both sides with 3.

$$-\frac{3}{9} > -\frac{9}{3}$$

$$-\frac{\cancel{3}}{\underset{\cancel{3}}{\cancel{9}}} \times \cancel{3} > -\frac{9}{\cancel{3}} \times \cancel{3} \quad \text{True}$$

$$-1 > -9$$

Hence, option B is the correct statement $\boxed{B}$.

(c) Consider the following inequality

$$-\frac{3}{9} < -\frac{9}{3}$$

Simplify the inequality by multiplying both sides with 3.

$$-\frac{3}{9} < -\frac{9}{3}$$

$$-\frac{\cancel{3}}{\cancel{9}_{3}} \times \cancel{3} < -\frac{9}{\cancel{3}} \times \cancel{3} \text{ False}$$

$$-1 \nless -9$$

(d) Consider the following inequality

$$\frac{9}{3} < \frac{3}{9}$$

Simplify the inequality by multiplying both sides with 3.

$$\frac{9}{3} < \frac{3}{9}$$

$$\frac{9}{\cancel{3}} \times \cancel{3} < \frac{\cancel{3}}{\cancel{9}_{3}} \times \cancel{3} \text{ False}$$

$$9 \nless 1$$

Answer 1VC8.

1. Consider the following inequality set.

$\{w \mid w \geq -14\}$

The inequality above is represented as set-builder notation.

Therefore, the inequality matches with *f* set builder notation.

2. Consider the following inequality statement

$x \leq y$, then $-5x \geq -5y$

Whenever a true inequality is multiplied with a negative number, the direction of the inequality symbol should be reversed.

Therefore, the inequality notation matches with *e* Multiplication Property of Inequalities.

3. Consider the following inequality statement

$p > -5$ and $p \leq 0$

This implies that *p* is greater than -5 and less or equal to 0. This represents a set of intersection of point.

Therefore, the inequality matches with *d* represents intersection.

4. Consider the following inequality statement

If $a < b$ then $a+2 < b+2$

Addition of any numbers on both sides of the inequality statement does not changes the inequality.

Therefore, the inequality matches with *a* Addition Property of Inequalities.

5. The graph on one side of the boundary is represented as half-plane.

Hence, the statement matches with *c* half-plane.

6. Consider the following inequality statement

If $s \geq t$ then $s-7 \geq t-7$

Subtraction of any numbers on both sides of the inequality statement does not change the inequality.

Therefore, the inequality matches with *g* Subtraction Property of Inequalities.

7. Consider the following inequality statement

$g \geq 7$ or $g < 2$

This implies that *g* is greater than or equal to 7 and less 2. This represents a union considering the *"or"* statement between the two inequalities.

Therefore, the inequality matches with *h* represents union.

8. Consider the following inequality statement

If $m > n$ then $\frac{m}{7} > \frac{n}{7}$

Division of any positive numbers on both sides of the inequality statement does not change the inequality.

Therefore, the inequality matches with *b* Division Property of Inequalities.

Answer 2PT.

Consider the following inequality:

$$6(a+5) < 2a+8$$

The objective is to solve the inequality and check the solution.

The grouped numbers can be simplified by using distributed property.

$$6a+30 < 2a+8$$

Simply the given expression by subtracting *2a* on both sides

$$6a+30 < 2a+8$$
$$6a+30-2a < 2a+8-2a$$
$$4a+30 < 8$$

Further simplify by subtracting both sides with 30.

$$4a+30<8$$
$$4a+30-30<8-30$$
$$4a<-22$$

Divide with 4 on both sides

$$4a<-22$$
$$\frac{\cancel{4}a}{\cancel{4}}<\frac{-\overset{11}{\cancel{22}}}{\underset{2}{\cancel{4}}}$$
$$a<-\frac{11}{2}$$

Therefore the solution set is represented as $\boxed{\{a \mid a<-\frac{11}{2}\}}$

In order to check the solution consider $a=-6$

Substitute $a=-6$ in the above inequality

$$6(a+5)<2a+8$$
$$6(-6+5)<2\times-6+8$$
$$-6<-12+8$$
$$-6<-4$$

The value of $a=-6$ satisfies the given inequality.

In order to check the solution consider $a=-5$

Substitute $a=-5$ in the given inequality

$$6(a+5)<2a+8$$
$$6(-5+5)<2\times-5+8$$
$$0<-10+8$$
$$0\not<-2$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{a \mid a<-\frac{11}{2}\}$.

Answer 2STP.

The objective is to find the correct statement.

Consider the following multiplication

$$(-6)(-7)$$

Multiplication of two negative integers is a positive integer.

6 times 7 is 42.

Hence,

$$(-6)(-7)=42$$

(a) -42 don't matches with the above product.

(b) -13 don't matches with the above product.

(c) 13 don't matches with the above product.

(d) 42 matches with the multiplication product.

Therefore, the right answer is 42 option $\boxed{D}$.

Answer 3PT.

Consider the following inequality:

$p>-5$ and $p\leq 0$

This implies that *p* is greater than -5 and less or equal to 0. This represents a set of intersection of point.

Consider the following inequality:

$g\geq 7$ or $g<2$

This implies that *g* is greater than or equal to 7 and less 2. This represents a union considering the *"or"* statement between the two inequalities.

Substitute the value of height and volume in the above relation to obtain radius of the cylinder.

$$V=\pi r^2 h$$
$$5625\pi=\pi r^2\times 25$$

Divide both sides by 25π.

$$5625\pi=\pi r^2\times 25$$
$$\frac{5625\pi}{25\pi}=\frac{\cancel{\pi} r^2\times 25}{25\cancel{\pi}} \quad 5625=225\times 25$$
$$225=r^2$$
$$r=\sqrt{225}$$

Square root of 225 is 15.

Therefore the radius of the cylinder is

$$r = \sqrt{225}$$
$$= 15 \text{ cm}$$

Hence, that matches with option $\boxed{C}$.

Answer 4PT.

The objective is compare and contrasts the inequalities.

Consider the following inequalities:

$$|x| \le 3$$

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

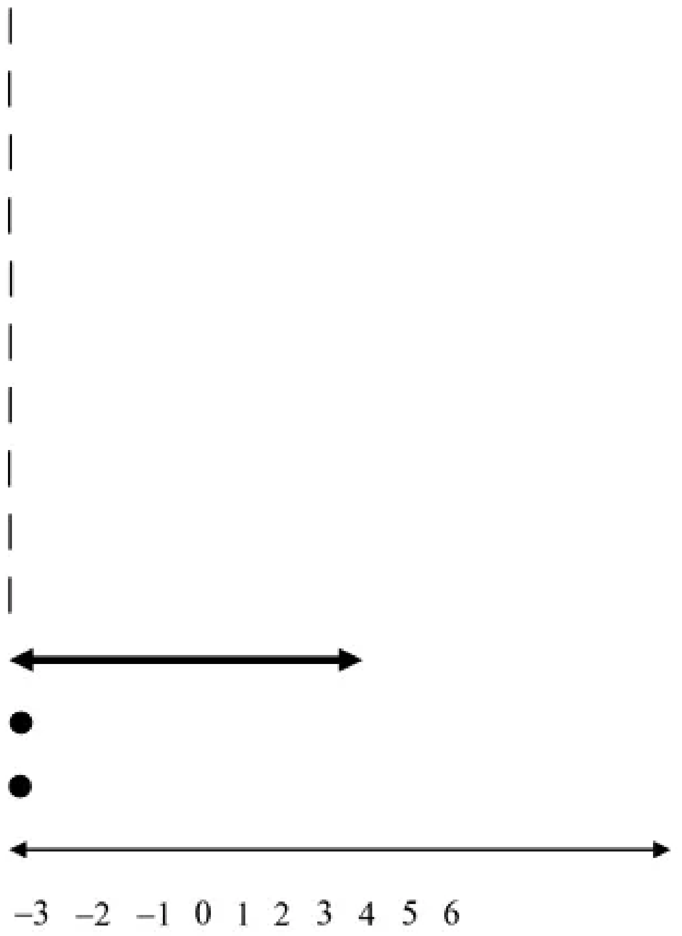
If $|a| < n$, then $a < n$ and $a > -n$

In this case the inequality is expressed as

$x \le 3$ and $x \ge -3$

Therefore, the solution set is represented as $\{x \mid -3 \le x \le 3\}$.

Graph the solution as follows:



Now consider the second inequality

$|x| \geq 3$

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

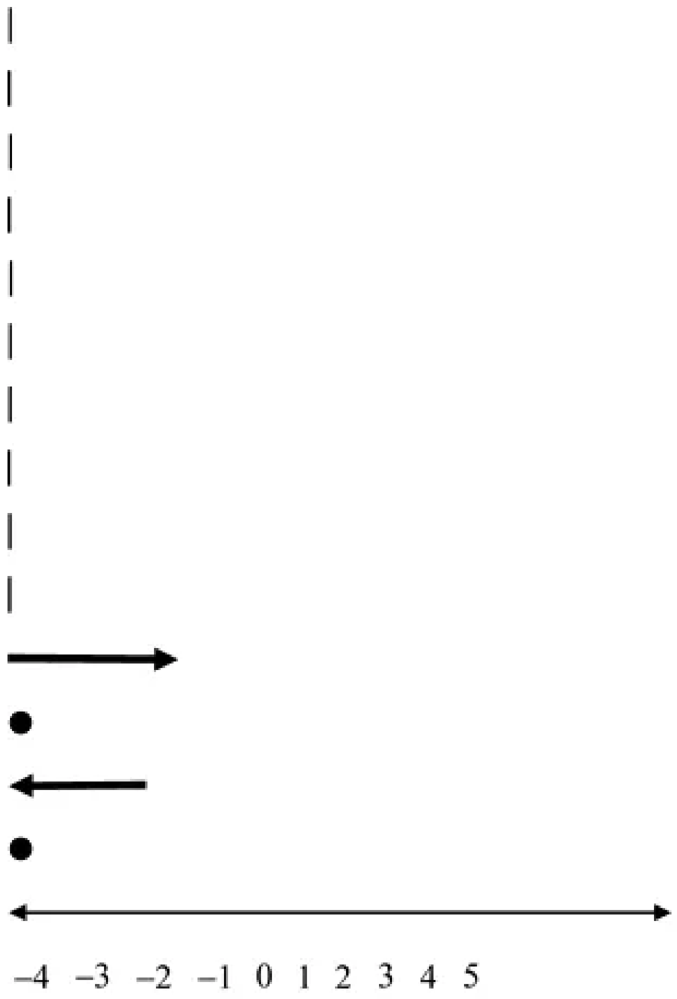
If $|a| > n$, then $a < -n$ or $a > n$

In this case the inequality is expressed as

$x \geq 3$ and $x \leq -3$

Therefore, the solution set is represented as $\{x \mid -3 \geq x \geq 3\}$.

Graph the solution as follows:



Answer 4STP.

The objective is to find how much time the repair technician work on the furnace.

The total bill amount is \$177.50.

Per hour charges are \$65. The cost of the parts is \$80.

Consider the time taken as *n*.

This can be expressed as following relation:

$80 + n \times 65 = 177.50$

Simplify the above expression by subtracting 80 on both sides.

$$80 + n \times 65 = 177.50$$
$$80 + n \times 65 - 80 = 177.50 - 80$$
$$65n = 97.5$$

Further simplify by dividing both sides with 65.

$$65n = 97.5$$
$$\frac{65n}{65} = \frac{97.5}{65}$$
$$n = 1.5$$

Therefore, the time taken to repair technician work on the furnace is $\boxed{1.5 \text{ hours}}$.

Hence, the answer matches with option $\boxed{B}$.

Answer 5PT.

Consider the following inequality:

$$-23 \geq g - 6$$

The objective is to solve the inequality and check the solution.

Simplify the given expression by adding 6 on both sides.

$$-23 \geq g - 6$$
$$-23 + 6 \geq g - 6 + 6$$
$$-17 \geq g$$
$$g \leq -17$$

Therefore the solution set is represented as $\boxed{\{g \mid g \leq -17\}}$

In order to check the solution consider $g = -17$

Substitute $g = -17$ in the inequality

$$-23 \geq g - 6$$
$$-23 \geq -17 - 6$$
$$-23 \geq -23$$

The value of $g = -17$ satisfies the inequality.

In order to check the solution consider $g=-20$

Substitute $g=-20$ in the given inequality

$$-23 \geq g-6$$
$$-23 \geq -20-6$$
$$-23 \ngeq -26$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{g \mid g \leq -17\}$.

Answer 5STP.

The objective is to find the maximum pulse rate of Cameron during exercise.

The maximum pulse rate during exercise is expressed as

$$P=\frac{4(220-A)}{5}$$

Where *P* is the maximum pulse rate, *A* is the age of the person.

Age of Cameron is 15 years.

Substitute the value of age *A*=15 in the above relation to the maximum pulse rate.

$$P=\frac{4(220-A)}{5}$$
$$=\frac{4(220-15)}{5}$$
$$=\frac{4\times \overset{41}{\cancel{205}}}{\cancel{5}}$$
$$=4\times 41=164$$

Therefore, the maximum pulse rate of Cameron during exercise is $\boxed{164}$.

Hence, the answer matches with option $\boxed{B}$.

Answer 6PT.

Consider the following inequality:

$$9p<8p-18$$

The objective is to solve the inequality and check the solution.

Simplify the given expression by subtracting *8p* on both sides.

$$9p<8p-18$$
$$9p-8p<8p-18-8p$$
$$p<-18$$

Therefore the solution set is represented as $\boxed{\{p \mid p<-18\}}$

In order to check the solution consider $p=-20$

Substitute $p=-20$ in the inequality

$$\begin{aligned}&9p<8p-18\\&9\times-20<8\times-20-18\\&-180<-160-18\\&-180<-178\end{aligned}$$ True

The value of $p=-20$ satisfies the inequality.

In order to check the solution consider $p=-10$

Substitute $p=-10$ in the given inequality

$$\begin{aligned}&9p<8p-18\\&9\times-10<8\times-10-18\\&-90<-80-18\\&-90\not<-98\end{aligned}$$ False

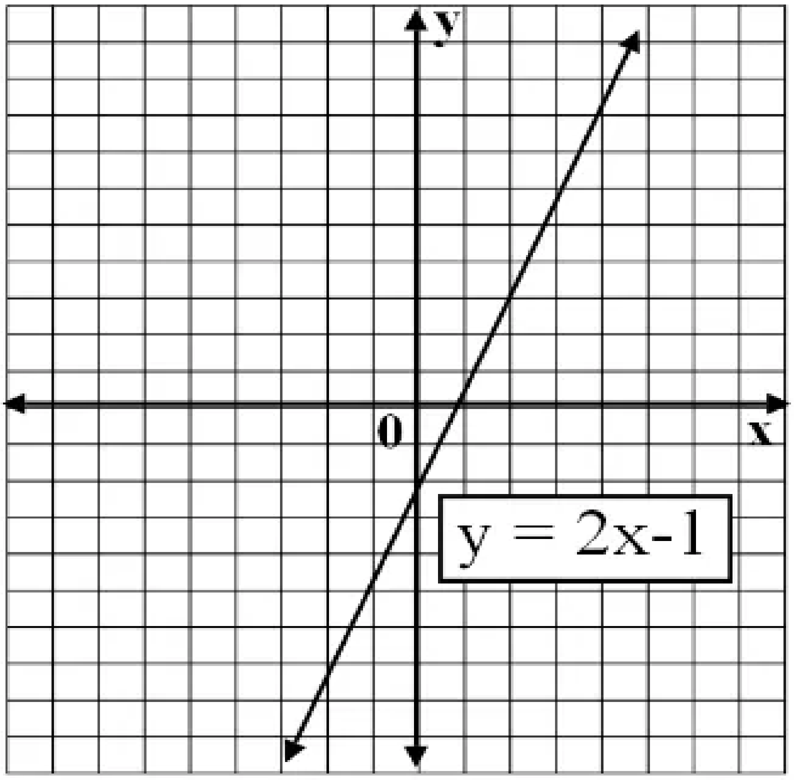
This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{p\mid p<-18\}$.

Answer 6STP.

The objective is to find the equation of the line.

Consider the function that is represented in graph.



Consider the equation

$y=2x-1$

The graph is translated three units up.

Any graph $y = f(x)$ is translated *a* units up is represented as $y = f(x) + a$

In this case

$$y = 2x - 1$$
$$y = 2x - 1 + 3$$
$$y - 2x + 2$$

Therefore, the new line in equation form is $\boxed{y - 2x + 2}$.

Hence, the answer matches with option $\boxed{A}$.

Answer 7PT.

Consider the following inequality:

$$d - 5 < 2d - 14$$

The objective is to solve the inequality and check the solution.

Simplify the given expression by subtracting *d* on both sides.

$$d - 5 < 2d - 14$$
$$d - 5 - d < 2d - 14 - d$$
$$-5 < d - 14$$

Further simplify by adding 14 on both sides.

$$-5 < d - 14$$
$$-5 + 14 < d - 14 + 14$$
$$9 < d$$
$$d > 9$$

Therefore the solution set is represented as $\boxed{\{d \mid d > 9\}}$

In order to check the solution consider $d = 10$

Substitute $d = 10$ in the inequality

$$d - 5 < 2d - 14$$
$$10 - 5 < 2 \times 10 - 14$$
$$5 < 20 - 14$$
$$5 < 6$$

True

The value of $d = 10$ satisfies the inequality.

In order to check the solution consider $d = 8$

Substitute $d = 8$ in the given inequality

$$\begin{aligned} &d - 5 < 2d - 14 \\ &8 - 5 < 2 \times 8 - 14 \\ &3 < 16 - 14 \\ &3 \not< 2 \end{aligned} \quad \text{False}$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{d \mid d > 9\}$.

Answer 7STP.

The objective is to find the correct equation that represents the correct set of values.

(a) Consider the equation

$$y = 2x + 2$$

In order to check the solution consider with first set of *x* and *y* values $(-4, -16)$

Substitute $(-4, -16)$ in the equation

$$\begin{aligned} &y = 2x + 2 \\ &-16 = 2 \times -4 + 2 \\ &-16 = -8 + 2 \\ &-16 \neq -6 \end{aligned} \quad \text{False}$$

The point $(-4, -16)$ doesn't satisfy the equation. No need to check the other set of values.

(b) Consider the equation

$y = 3x + 2$

In order to check the solution consider with first set of *x* and *y* values $(-4, -16)$

Substitute $(-4, -16)$ in the equation

$$\begin{aligned} y &= 3x + 2 \\ -16 &= 3 \times -4 + 2 \\ -16 &= -12 + 2 \\ -16 &\neq -10 \end{aligned}$$ False

The point $(-4, -16)$ doesn't satisfy the equation. No need to check the other set of values.

(c) Consider the equation

$y = 2x - 10$

In order to check the solution consider with first set of *x* and *y* values $(-4, -16)$

Substitute $(-4, -16)$ in the equation

$$\begin{aligned} y &= 2x - 10 \\ -16 &= 2 \times -4 - 10 \\ -16 &= -8 - 10 \\ -16 &\neq -18 \end{aligned}$$ False

The point $(-4, -16)$ doesn't satisfy the equation. No need to check the other set of values.

(d) Consider the equation

$y = 4x$

In order to check the solution consider with first set of *x* and *y* values $(-4, -16)$

Substitute $(-4, -16)$ in the equation

$$\begin{aligned} y &= 4x \\ -16 &= 4 \times -4 \\ -16 &= -16 \end{aligned}$$ True

The point $(-4, -16)$ satisfies the equation.

Now consider $(-1, -4)$

Substitute $(-1, -4)$ in the equation

$$\begin{aligned} y &= 4x \\ -4 &= 4 \times -1 \\ -4 &= -4 \end{aligned}$$ True

The point $(-1, -4)$ also satisfies the equation.

Now consider $(2,8)$

Substitute $(2,8)$ in the equation

$y = 4x$

$8 = 4\times 2$ True

$8 = 8$

The point $(-1,-4)$ also satisfies the equation.

Therefore, the table set of values for *x* and *y* satisfies option D.

Hence, answer is $\boxed{D}$.

Answer 8PT.

Consider the following inequality:

$$\frac{7}{8}w \geq -21$$

The objective is to solve the inequality and check the solution.

Simplify the given expression by multiplying 8/7 on both sides.

$$\frac{7}{8}w \geq -21$$

$$\frac{\cancel{7}}{\cancel{8}}w\times\frac{\cancel{8}}{\cancel{7}} \geq -2\overset{3}{\cancel{1}}\times\frac{8}{\cancel{7}}$$

$$w \geq -24$$

Therefore the solution set is represented as $\boxed{\{w \mid w \geq -24\}}$

In order to check the solution consider $w = -24$

Substitute $w = -24$ in the inequality

$$\frac{7}{8}w \geq -21$$

$$\frac{7}{\cancel{8}}\times -2\overset{3}{\cancel{4}} \geq -21 \quad \text{True}$$

$$-21 \geq -21$$

The value of $w = -24$ satisfies the inequality.

In order to check the solution consider $w = -32$

Substitute $w = -32$ in the given inequality

$$\frac{7}{8}w \geq -21$$

$$\frac{7}{\cancel{8}}\times -3\overset{4}{\cancel{2}} \geq -21 \quad \text{False}$$

$$-28 \ngeq -21$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{w \mid w \geq -24\}$.

Answer 8STP.

The objective is to write the inequality for the given situation.

Consider *x* as the fourth test score for Ali. At least 80 should be scored on an average. The scores on three tests were given were 78, 82 and 75.

This can be expressed as following inequality

$$\frac{78+82+75+x}{4} \geq 80$$

Therefore, the inequality for the given situation is expressed as $\boxed{\frac{78+82+75+x}{4} \geq 80}$.

Hence, the answer matches with option $\boxed{B}$.

Answer 9PT.

Consider the following inequality:

$$-22b \leq 99$$

The objective is to solve the inequality and check the solution.

Simplify the given expression by multiplying -22 on both sides and change the inequality symbol.

$$-22b \leq 99$$

$$\frac{-22b}{-22} \geq \frac{99}{-22}$$ 11 times 9 = 99, 11 times 2 is 22.

$$b \geq -\frac{9}{2}$$

Therefore the solution set is represented as $\boxed{\{b \mid b \geq -\frac{9}{2}\}}$

In order to check the solution consider $b = -4$

Substitute $b = -4$ in the inequality

$$-22b \leq 99$$

$$-22 \times -4 \leq 99$$ True

$$88 \leq 99$$

The value of $b = -4$ satisfies the inequality.

In order to check the solution consider $b = -5$

Substitute $b = -5$ in the given inequality

$-22b \le 99$

$-22 \times -5 \le 99$ False

$110 \not\le 99$

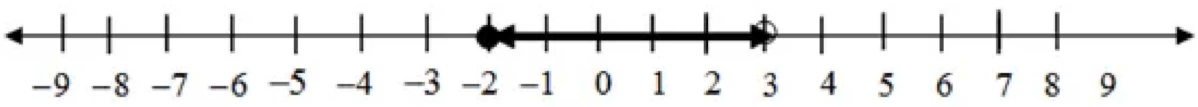
This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{b \mid b \ge -\frac{9}{2}\}$.

Answer 9STP.

The objective is to find the inequality based on the graph shown.

Consider the following graph:



The graph can be represented as $x \ge -2$ and $x < 3$

The dotted circle at -2 represents it is include and, open circle 3 doesn't not include. The value lies between -2 and 3.

The solution set is represented as $\boxed{\{x \mid -2 \le x < 3\}}$.

Hence, the answer matches with option $\boxed{C}$.

Answer 10E.

Consider the following inequality:

$r + 7 > -5$

The objective is to solve the inequality and graph it on the number line.

Simply the given expression by subtracting 7 on both sides

$r + 7 > -5$

$r + 7 - 7 > -5 - 7$

$r > -12$

Therefore the solution set is represented as $\boxed{\{r \mid r > -12\}}$

In order to check the solution consider $r=-10$

Substitute $r=-10$ in the given inequality

$r+7>-5$

$-10+7>-5$

$-3>-5$

The value of $r=-10$ satisfies the given inequality.

In order to check the solution consider $r=-15$

Substitute $r=-15$ in the given inequality

$r+7>-5$

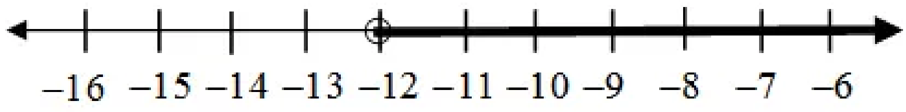
$-15+7>-5$

$-8 \not> -5$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{r \mid r>-12\}$.

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number -12.



Answer 10PT.

Consider the following inequality:

$4m-11 \geq 8m+7$

The objective is to solve the inequality and check the solution.

Simplify the given expression by subtracting *4m* on both sides.

$4m-11 \geq 8m+7$

$4m-11-4m \geq 8m+7-4m$

$-11 \geq 4m+7$

Further simplify the inequality by subtracting 7 on both sides.

$-11 \geq 4m+7$

$-11-7 \geq 4m+7-7$

$-18 \geq 4m$

Divide 4 on both sides.

$\frac{-18}{4} \geq \frac{4m}{4}$

$-\frac{9}{2} \geq m$

$m \leq -4.5$

Therefore the solution set is represented as $\boxed{\{m \mid m \leq -4.5\}}$.

In order to check the solution consider $b=-5$

Substitute $b=-5$ in the inequality

$$\begin{aligned}
&4m-11 \geq 8m+7 \\
&4\times-5-11 \geq 8\times-5+7 \\
&-20-11 \geq -40+7 \\
&-31 \geq -33
\end{aligned}$$

True

The value of $b=-5$ satisfies the inequality.

In order to check the solution consider $b=-4$

Substitute $b=-4$ in the given inequality

$$\begin{aligned}
&4m-11 \geq 8m+7 \\
&4\times-4-11 \geq 8\times-4+7 \\
&-16-11 \geq -32+7 \\
&-27 \not\geq -25
\end{aligned}$$

False

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{m \mid m \leq -4.5\}$.

Answer 10STP.

The objective is to find the number of times of getting a number less than 5, when a die is rolled.

A die consists of six numbers; four of these numbers will be less than 5.

When a die is rolled the changes of getting numbers less than 5 will be, 1, 2,3,4,5 which tells out of 6 times there might be probability getting numbers less than 5 will be 5 times.

Hence, the answer is 5/6.

Answer 11E.

In order to check the solution consider $w=37$

Substitute $w=37$ in the given inequality

$$\begin{aligned}
&w-14 \leq 23 \\
&37-14 \leq 23 \\
&23 \leq 23
\end{aligned}$$

The value of $w=37$ satisfies the given inequality.

Answer 11PT.

Consider the following inequality:

$$-3(k-2)>12$$

The objective is to solve the inequality and check the solution.

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the given expression by dividing with -3 on both sides and change the inequality symbol.

$$-3(k-2)>12$$
$$\frac{-3(k-2)}{-3}<\frac{12}{-3}$$
$$k-2<-4$$

Further simplify the inequality by adding 2 on both sides.

$$k-2<-4$$
$$k-2+2<-4+2$$
$$k<-2$$

Therefore the solution set is represented as $\boxed{\{k \mid k<-2\}}$.

In order to check the solution consider $k=-3$

Substitute $k=-3$ in the inequality

$$-3(k-2)>12$$
$$-3(-3-2)>12 \quad \text{True}$$
$$-3\times -5>12$$
$$15>12$$

The value of $k=-3$ satisfies the inequality.

In order to check the solution consider $k=-1$

Substitute $k=-1$ in the given inequality

$$-3(k-2)>12$$
$$-3(-1-2)>12 \quad \text{False}$$
$$-3\times -3>12$$
$$9 \not> 12$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{k \mid k<-2\}$.

Answer 11STP.

The objective is to find the time taken by car to travel 117 miles.

The average speed of the car is 54 miles/hr.

The velocity of an object is expressed as

$$v = \frac{d}{t}$$

Where *v*, is the velocity/speed, *d* is the distance and *t* is time.

The time taken for the car is expressed as

$$t = \frac{d}{v}$$

Substitute distance $d = 117 \text{ miles}$ and speed $v = 54 \text{ miles/hr}$ in the above relation

$$t = \frac{117}{54}$$
$$= 2.1667 \text{ hrs}$$

Converting hours into minutes

$$t = 2.1667 \times 60 \text{ mins}$$
$$= 130 \text{ minutes}$$

Therefore, the time taken by car to travel 117 miles is $\boxed{130 \text{ minutes}}$.

Answer 12E.

Consider the following inequality:

$$a - 6 > -10$$

The objective is to solve the inequality and graph it on the number line.

Simply the given expression by adding 6 on both sides

$$a - 6 > -10$$
$$a - 6 + 6 > -10 + 6$$
$$a > -4$$

Therefore the solution set is represented as $\boxed{\{a \mid a > -4\}}$

In order to check the solution consider $a = -3$

Substitute $a = -3$ in the given inequality

$$a - 6 > -10$$
$$-3 - 6 > -10$$
$$-9 > -10$$

The value of $a = -3$ satisfies the given inequality.

In order to check the solution consider $a = -5$

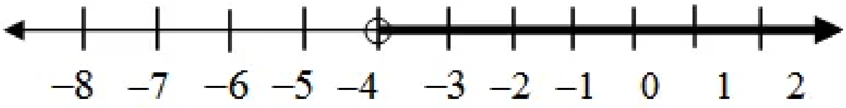
Substitute $a = -5$ in the given inequality

$$a - 6 > -10$$
$$-5 - 6 > -10$$
$$-11 \not> -10$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{a \mid a > -4\}$.

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number -4.



Answer 12PT.

Consider the following inequality:

$$\frac{f-5}{3} > -3$$

The objective is to solve the inequality and check the solution.

Simplify the given expression by multiplying with 3 on both sides.

$$\frac{f-5}{3} > -3$$
$$\frac{f-5}{3} \times 3 > -3 \times 3$$
$$f - 5 > -9$$

Further simplify the inequality by adding 5 on both sides.

$$f - 5 > -9$$
$$f - 5 + 5 > -9 + 5$$
$$f > -4$$

Therefore the solution set is represented as $\boxed{\{f \mid f > -4\}}$.

In order to check the solution consider $f=-3$

Substitute $f=-3$ in the inequality

$$\frac{f-5}{3}>-3$$
$$\frac{-3-5}{3}>-3 \text{ True}$$
$$-\frac{8}{3}>-3$$

The value of $f=-3$ satisfies the inequality.

In order to check the solution consider $f=-7$

Substitute $f=-7$ in the given inequality

$$\frac{f-5}{3}>-3$$
$$\frac{-7-5}{3}>-3 \text{ False}$$
$$\frac{-12}{3}>-3$$
$$-4 \not> -3$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{f \mid f>-4\}$.

Answer 12STP.

The objective is to find the percentage decrease in the price of tape player.

The initial price of the tape player is $48.

The reduced price is $36.

The percentage reduction of the tape player is expressed as

$$\% \text{ Change} = \frac{\text{Final Price - Initial Price}}{\text{Initial Price}} \times 100$$

Substitute the final and initial price values

$$\% \text{ Change} = \frac{36-48}{48} \times 100$$
$$= -\frac{12}{48} \times 100$$
$$= -25\%$$

Negative symbol indicates reduction.

Therefore, the percentage decrease in the price of tape player is $\boxed{25\%}$.

Answer 13E.

Consider the following inequality:

$$-0.11 \geq n - (-0.04)$$

The objective is to solve the inequality and graph it on the number line.

Simply the given expression

$$-0.11 \geq n + 0.04$$

Now subtract 0.04 on both sides

$$-0.11 \geq n + 0.04$$
$$-0.11 - 0.04 \geq n + 0.04 - 0.04$$
$$-0.15 \geq n$$
$$n \leq -0.15$$

Therefore the solution set is represented as $\boxed{\{n \mid n \leq -0.15\}}$

In order to check the solution consider $n = -0.15$

Substitute $n = -0.15$ in the given inequality

$$-0.11 \geq n - (-0.04)$$
$$-0.11 \geq -0.15 - (-0.04)$$
$$-0.11 \geq -0.15 + 0.14$$
$$-0.11 \geq -0.11$$

The value of $n = -0.15$ satisfies the given inequality.

In order to check the solution consider $n = -0.1$

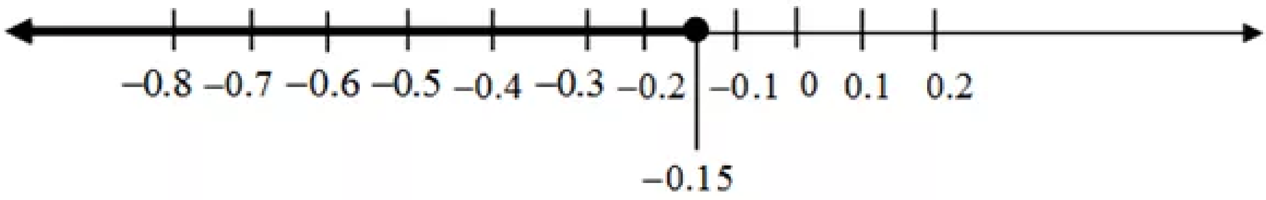
Substitute $n = -0.1$ in the given inequality

$$-0.11 \geq n - (-0.04)$$
$$-0.11 \geq -0.1 - (-0.04)$$
$$-0.11 \geq -0.1 + 0.04$$
$$-0.11 \not\geq -0.06$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{n \mid n \leq -0.15\}$.

The inequality can be represented in the graph with the closed circle and heavy arrow mark left to the number -0.15.



Answer 13PT.

Consider the following inequality:

$$0.3(y-4) \leq 0.8(0.2y+2)$$

The objective is to solve the inequality and check the solution.

The grouped numbers can be simplified by using distributed property.

$$0.3(y-4) \leq 0.8(0.2y+2)$$
$$0.3y - 1.2 \leq 0.16y + 1.6$$

Simplify the inequality by subtracting *0.16y* on both sides.

$$0.3y - 1.2 \leq 0.16y + 1.6$$
$$0.3y - 1.2 - 0.16y \leq 0.16y + 1.6 - 0.16y$$
$$0.14y - 1.2 \leq 1.6$$

Further simplify the inequality by adding 1.2 on both sides.

$$0.14y - 1.2 \leq 1.6$$
$$0.14y - 1.2 + 1.2 \leq 1.6 + 1.2$$
$$0.14y \leq 2.8$$

Divide both sides with 0.14.

$$0.14y \leq 2.8$$
$$\frac{0.14y}{0.14} \leq \frac{2.8}{0.14}$$
$$y \leq 20$$

Therefore the solution set is represented as $\boxed{\{y \mid y \leq 20\}}$.

Answer 13STP.

The objective is to find the image of the quadrilateral vertices over *y*-axis.

Quadrilateral vertices of *MNOP* are $M(0,-4)$, $N(-2,8)$, $O(5,3)$ and $P(2,-9)$.

For any set of point the image point on the *y*-axis will be the opposite sign of the given *y*-coordinate.

Hence, writing the opposite sign for the *y*-coordinate of the Quadrilateral *MNOP* will be

$M(0,-(-4))$, $N(-2,-8)$, $O(5,-3)$ and $P(2,-(-9))$.

Therefore, the image of the quadrilateral vertices over *y*-axis is

$\boxed{M(0,4),N(-2,-8),O(5,-3),P(2,9)}$.

Answer 14E.

Consider the following inequality:

$$2.3 < g-(-2.1)$$

The objective is to solve the inequality and graph it on the number line.

Simply the given expression

$$2.3 < g+2.1$$

Now subtract 2.1 on both sides

$$2.3 < g+2.1$$
$$2.3-2.1 < g+2.1-2.1$$
$$0.2 < g$$
$$g > 0.2$$

Therefore the solution set is represented as $\boxed{\{g \mid g > 0.2\}}$

In order to check the solution consider $g = 0.3$

Substitute $g = 0.3$ in the given inequality

$$2.3 < g-(-2.1)$$
$$2.3 < 0.3-(-2.1)$$
$$2.3 < 2.4$$

The value of $g = 0.3$ satisfies the given inequality.

In order to check the solution consider $g = 0.1$

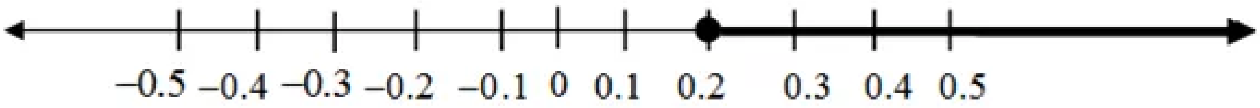
Substitute $g = 0.1$ in the given inequality

$$2.3 < g - (-2.1)$$
$$2.3 < 0.1 - (-2.1)$$
$$2.3 \not< 2$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{g \mid g > 0.2\}$.

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number 0.2.



Answer 14PT.

The objective is to find the selling price of the house.

Consider selling price of the house be n. Home owner gives 7% of the selling price to agent. She wants to have $110,000 after she paid to the agent.

This can be expressed in inequality form as

$$n - 0.07n \geq \$110,000$$

Simplify the above inequality by grouping n terms

$$n - 0.07n \geq \$110,000$$
$$n(1 - 0.07) \geq \$110,000$$
$$0.93n \geq \$110,000$$

Simplify the inequality by dividing both sides by 0.93.

$$0.93n \geq \$110,000$$
$$\frac{0.93n}{0.93} \geq \frac{\$110,000}{0.93}$$
$$n \geq \$118,280$$

Therefore, the solution set represents as $\boxed{\{n \mid n \geq \$118,280\}}$.

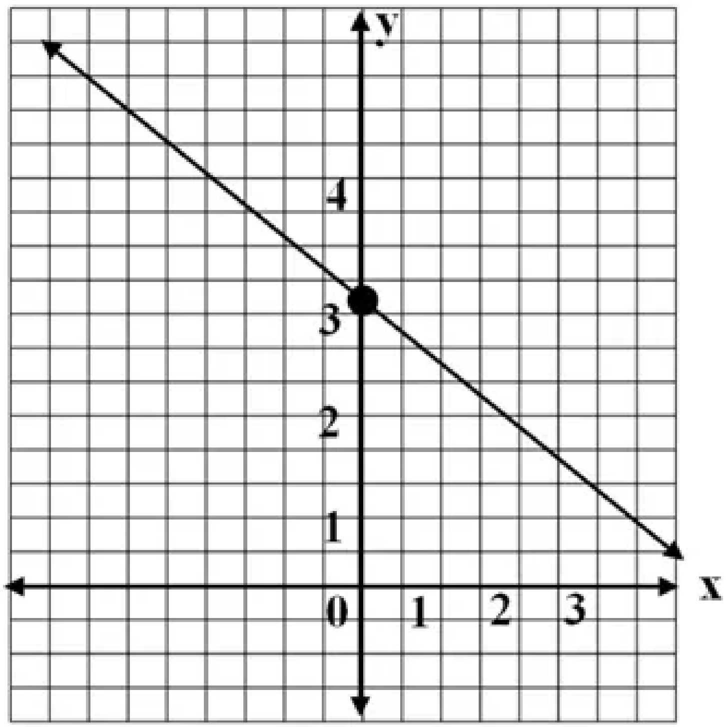
Therefore, the homeowner should sell house at least $118,280 or more.

Answer 14STP.

The objective is to find write the equation for the following graph.

Consider the following graph:

Assumes that the line passes through a point (0,3) and (4,0).



The equation of line representing the slope intercept form is

$y = mx + c$ Where m is the slope of the line

In order to find the equation of the line, first we need to calculate the slope of the line.

That is expressed using the formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

The given points are

$$(x_1, y_1) = (0,3)$$
$$(x_2, y_2) = (4,0)$$

Substitute the values to obtain the slope

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{0-3}{4-0}$$
$$= -\frac{3}{4}$$

The constant *c* is the *y*-intercept. In this case *y*-intercept is 3.

Substitute *m* and *y*-intercept

$$y = -\frac{3}{4}x + 3$$

Therefore, the equation of the line shown is graph is $\boxed{y = -\frac{3}{4}x + 3}$.

Answer 15E.

Consider the following inequality:

$$7h \le 6h - 1$$

The objective is to solve the inequality and graph it on the number line.

Simply the given expression by subtracting *6h* on both sides

$$7h \le 6h - 1$$
$$7h - 6h \le 6h - 1 - 6h$$
$$h \le -1$$

Therefore the solution set is represented as $\boxed{\{h \mid h \le -1\}}$

In order to check the solution consider $h = -1$

Substitute $h = -1$ in the given inequality

$$7h \le 6h - 1$$
$$7 \times -1 \le 6 \times -1 - 1$$
$$-7 \le -6 - 1$$
$$-7 \le -7$$

The value of $h = -1$ satisfies the given inequality.

In order to check the solution consider $h=1$

Substitute $h=1$ in the given inequality

$7h \le 6h-1$

$7\times1 \le 6\times1-1$

$7 \le 6-1$

$7 \not\le 5$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{h \mid h \le -1\}$.

The inequality can be represented in the graph with the closed circle and heavy arrow mark left to the number -1.

Answer 15PT.

Consider the following relation:

$6+|r|=3$

The objective is to solve the equation and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

The absolute value of $|a|=a$ or $|a|=-a$

Simplify the given relation by subtracting 6 on both sides.

$6+|r|=3$

$6+|r|-6=3-6$

$|r|=-3$

In this case the equation is expressed as

$r=-3$ or $r=3$

Therefore, the solution set is represented as $\boxed{\{-3,3\}}$.

Answer 15STP.

The objective is to find the slope of the parallel line.

Consider the following equation:

$$\frac{1}{3}y = \frac{2}{3}x - 1$$

The equation of line representing the slope intercept form is

$y = mx + c$ Where *m* is the slope of the line

For a set of parallel lines the slope of them will remains same.

Write the equation in slope intercept form

$$\frac{1}{3}y = \frac{2}{3}x - 1$$

$$y = 3\times\frac{2}{3}x - 3\times 1 \quad \text{Multiply both sides by 3.}$$

$$y = 2x - 3$$

Therefore, the slope of the line is $m = 3$.

Therefore, the slope of the parallel line will also be the same i.e $\boxed{m = 3}$.

Answer 16E.

Consider the following inequality:

$$5b > 4b + 5$$

The objective is to solve the inequality and graph it on the number line.

Simply the given expression by subtracting *4b* on both sides

$$5b > 4b + 5$$
$$5b - 4b > 4b + 5 - 4b$$
$$b > 5$$

Therefore the solution set is represented as $\boxed{\{b \mid b > 5\}}$

In order to check the solution consider $b = 6$

Substitute $b = 6$ in the given inequality

$$5b > 4b + 5$$
$$5\times 6 > 4\times 6 + 5$$
$$30 > 24 + 5$$
$$30 > 29$$

The value of $b = 6$ satisfies the given inequality.

In order to check the solution consider $b=4$

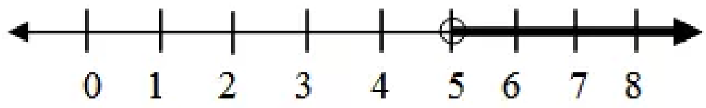
Substitute $b=4$ in the given inequality

$$5b>4b+5$$
$$5\times4>4\times4+5$$
$$20>16+5$$
$$20 \not> 21$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{b \mid b>5\}$.

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number 5.



Answer 16PT.

Consider the following inequality:

$$|d|>-2$$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|>n$, then $a<-n$ or $a>n$

In this case the inequality is expressed as

$$d>-2$$

or

$$d<-(-2)$$
$$d<2$$

Therefore, the solution set is represented as $\boxed{\{d \mid -2<d<2\}}$.

Answer 16STP.

Consider the following inequality

$$\frac{1}{2}(10x-8)-3(x-1)\geq 15$$

The objective is to solve the inequality.

The grouped numbers can be simplified by using distributed property.

$$\frac{1}{2}(10x-8)-3(x-1)\geq 15$$
$$\left(\frac{10}{2}x-\frac{8}{2}\right)-3x-3\geq 15$$
$$5x-4-3x+3\geq 15$$

Combine the like terms

$$5x-4-3x+3\geq 15$$
$$2x-1\geq 15$$

Simplify the above inequality by adding 1 on both sides.

$$2x-1\geq 15$$
$$2x-1+1\geq 15+1$$
$$2x\geq 16$$

Further simplify the above inequality by dividing 2 on both sides

$$2x\geq 16$$
$$\frac{2x}{2}\geq\frac{16}{2}$$
$$x\geq 8$$

Therefore, the solution set represents as $\boxed{\{x\mid x\geq 8\}}$.

Answer 17E.

The objective is to write the inequality for the given sentence.

Consider the number as *n*, Twenty one is no less than (greater than or equal to) number *n* plus negative 2.

This can be expressed as following inequality

$$21\geq n-2$$

Simplify the given expression by adding 2 on both sides

$$21 \geq n-2$$
$$21+2 \geq n-2+2$$
$$23 \geq n$$
$$n \leq 23$$

The number is less than or equal to 23.

The solution set is represented as $\boxed{\{n \mid n \leq 23\}}$.

In order to check the solution consider $n=23$

Substitute $n=23$ in the given inequality

$$21 \geq n-2$$
$$21 \geq 23-2$$
$$21 \geq 21$$

The value of $n=23$ satisfies the given inequality.

In order to check the solution consider $n=25$

Substitute $n=25$ in the given inequality

$$21 \geq n-2$$
$$21 \geq 25-2$$
$$21 \not\geq 23$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{n \mid n \leq 23\}$.

Answer 17PT.

Consider the following inequality:

$r+3>2$ and $4r<12$

The objective is to solve the inequality and graph the solution set.

Consider the first inequality.

$$r+3>2$$

Simplify the inequality by subtracting 3 on both sides.

$$r+3>2$$
$$r+3-3>2-3$$
$$r>-1$$

Hence, the solution set represented for first inequality is $\{r \mid r>-1\}$.

Now consider the second inequality.

$4r < 12$

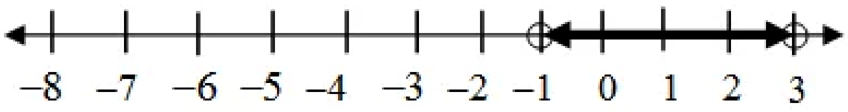
Simplify the inequality by dividing with 4 on both sides.

$$4r < 12$$
$$\frac{4r}{4} < \frac{12}{4}$$
$$r < 3$$

Hence, the solution set represented for second inequality is $\{r \mid r < 3\}$.

The intersection of the numbers $r < 3$ and $r > -1$.

Therefore, the solution set is presented as $\boxed{\{r \mid -1 < r < 3\}}$.



Answer 17STP.

Consider the following inequality:

$$|x-3| > 5$$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a| > n$, then $a < -n$ or $a > n$

In this case the inequality is expressed as

$x-3 > 5$ or $x-3 < -5$

First consider the first inequality.

$$x-3 > 5$$

Simplify the inequality by adding 3 on both sides.

$$x-3 > 5$$
$$x-3+3 > 5+3$$
$$x > 8$$

Hence, the solution for first inequality is $x > 8$.

Now consider the second inequality.

$x-3<-5$

Simplify the inequality by adding 3 on both sides.

$x-3<-5$
$x-3+3<-5+3$
$x<-2$

Hence, the solution for second inequality is $x<-2$.

Therefore, the solution set is represented as $\boxed{\{w \mid -2>x>8\}}$.

Answer 18E.

Consider the following inequality:

$15v>60$

The objective is to solve the inequality and check the solution.

Simplify the inequality by dividing both sides with 15.

The inequalities can be expressed as

$15v>60$

$\frac{15v}{15}>\frac{60}{15} \quad 4\times 15=60$

$v>4$

Therefore, the solution set represents as $\boxed{\{v \mid v>4\}}$.

In order to check the solution consider $v=5$

Substitute $v=5$ in the given inequality

$15v>60$
$15\times 5>60$
$75>60$

The value of $v=5$ satisfies the given inequality.

Now consider $v=3$

Substitute $v=3$ in the given inequality

$15v>60$
$15\times 3>60$
$45 \not> 60$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{v \mid v>4\}$.

Answer 18PT.

Consider the following inequality:

$3n+2 \geq 17$ or $3n+2 \leq -1$

The objective is to solve the inequality and graph the solution set.

Consider the first inequality.

$3n+2 \geq 17$

Simplify the inequality by subtracting 2 on both sides.

$$3n+2 \geq 17$$
$$3n+2-2 \geq 17-2$$
$$3n \geq 15$$

Further divide both sides with 3.

$$3n \geq 15$$
$$\frac{3n}{3} \geq \frac{15}{3}$$
$$n \geq 5$$

Hence, the solution set represented for first inequality is $\{n \mid n \geq 5\}$.

Now consider the second inequality.

$3n+2 \leq -1$

Simplify the inequality by subtracting 2 on both sides.

$$3n+2 \leq -1$$
$$3n+2-2 \leq -1-2$$
$$3n \leq -3$$

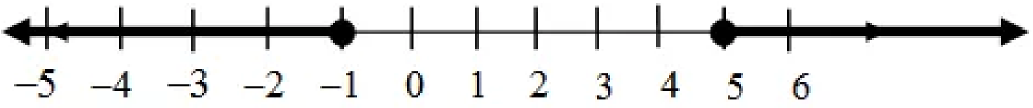
Further divide both sides with 3.

$$3n \leq -3$$
$$\frac{3n}{3} \leq -\frac{3}{3}$$
$$n \leq -1$$

Hence, the solution set represented for second inequality is $\{n \mid n \leq -1\}$.

The compound inequality is represented as $n \le -1$ or $n \ge 5$.

Therefore, the solution set is represented as $\boxed{\{n \mid -1 \ge n \text{ or } n \ge 5\}}$.



Answer 18STP.

The objective is to graph the inequality.

Consider the following inequality:

$y < -2x + 4$

First step is to change the inequality to an equation.

$y = -2x + 4$

Start with set of values for *x*, substituting different values of *x* will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x = 0$

$y = -2x + 4$
$y = -2 \times 0 + 4$
$y = 4$

Hence, the point is $(0,4)$.

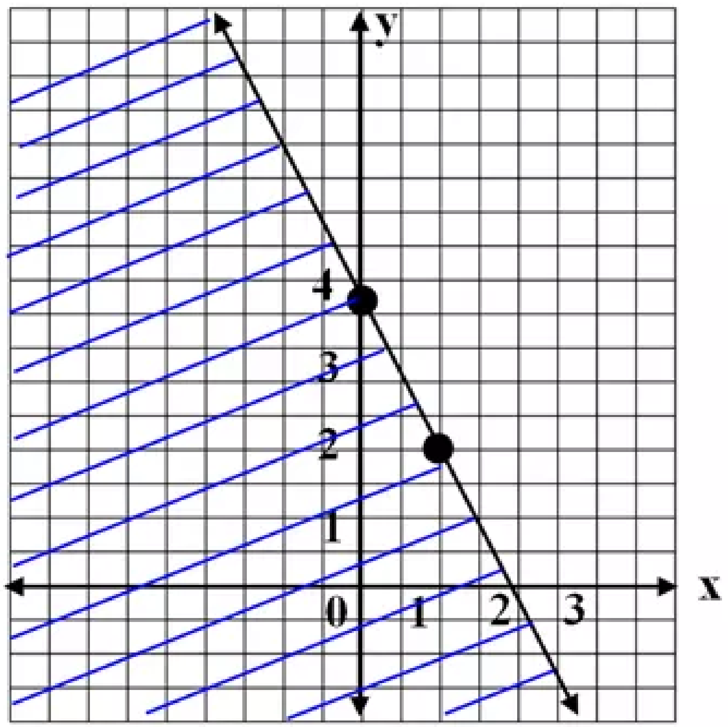
Consider $x = 1$

$y = -2x + 4$
$y = -2 \times 1 + 4$
$y = 2$

Hence, the point is $(1,2)$.

Draw a dotted line passing through the above points. Since $y <$, shade below the line

Hence, $y < -2x + 4$ is shown as:



Answer 19E.

Consider the following inequality:

$12r \le 72$

The objective is to solve the inequality and check the solution.

Simplify the inequality by dividing both sides with 12.

The inequalities can be expressed as

$$12r \le 72$$
$$\frac{12r}{12} \le \frac{72}{12} \quad 6 \times 12 = 72$$
$$r \le 6$$

Therefore, the solution set represents as $\boxed{\{r \mid r \le 6\}}$.

In order to check the solution consider $r = 6$

Substitute $r = 6$ in the given inequality

$$12r \le 72$$
$$12 \times 6 \le 72$$
$$72 \le 72$$

The value of $r = 6$ satisfies the given inequality.

Now consider $r = 7$

Substitute $r = 7$ in the given inequality

$$12r \leq 72$$
$$12 \times 7 \leq 72$$
$$84 \not\leq 72$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{r \mid r \leq 6\}$.

Answer 19PT.

Consider the following inequality:

$9 + 2p > 3$ and $-13 > 8p + 3$

The objective is to solve the inequality and graph the solution set.

Consider the first inequality.

$$9 + 2p > 3$$

Simplify the inequality by subtracting 9 on both sides.

$$9 + 2p > 3$$
$$9 + 2p - 9 > 3 - 9$$
$$2p > -6$$

Further divide both sides with 2.

$$2p > -6$$
$$\frac{2p}{2} > \frac{-6}{2}$$
$$p > -3$$

Hence, the solution set represented for first inequality is $\{p \mid p > -3\}$.

Now consider the second inequality.

$$-13 > 8p + 3$$

Simplify the inequality by subtracting 3 on both sides.

$$-13 > 8p + 3$$
$$-13 - 3 > 8p + 3 - 3$$
$$-16 > 8p$$

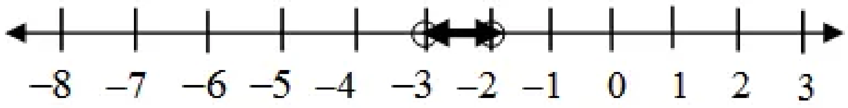
Further divide both sides with 8.

$$-16 > 8p$$
$$\frac{-16}{8} > \frac{8p}{8}$$
$$-2 > p$$
$$p < -2$$

Hence, the solution set represented for second inequality is $\{p \mid p < -2\}$.

The intersection of numbers are represented as $p > -3$ or $p < -2$.

Therefore, the solution set is presented as $\boxed{\{p \mid -3 < p < -2\}}$.



Answer 19STP.

The objective is to find the possible lengths of Carlson family's house.

Consider *L* length of the lot is 91 feet. The *w* width of the lot is 158 feet. As per the Town law the house cannot be as close to 10 feet to the edges. Which means 10 feet of gap should be left alone on both length and width of the loot.

(a) The inequality is expressed by reducing 20 feet on both sides for length and width

$L < 91 - 20$ and $w < 158 - 20$

Therefore, the inequality is

$L < 71$ and $w < 138$

(b) The objective is to build a house which is at least (greater than or equal) 2800 square feet and no more than (less than or equal) 3200 square feet width.

Consider the width of the house as *w*.

Assuming the maximum possible length with leaving the gap is 71 feet.

The area of the house is then expressed as

$$\begin{aligned} A &= L \times w \\ &= 71w \end{aligned}$$

As mentioned in the statement the area of the house is expressed as following inequality:

$2800 \le 71w \le 3200$

Simplify the above inequality by dividing both sides with 71.

$\frac{2800}{71} \le \frac{71}{71} w \le \frac{3200}{71}$ Doing the math $7 \times 4 = 28, 7 \times 4.5 = 31.5$

$38 \le w \le 45$

Therefore, the solution set represents as $\boxed{\{w \mid 38 \le w \le 45\}}$.

Answer 20E.

Consider the following inequality:

$$-15z \geq -75$$

The objective is to solve the inequality and check the solution.

Whenever a true inequality is multiplied or divided by a negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by dividing both sides by -15 and change the inequality symbol.

The inequalities can be expressed as

$$-15z \geq -75$$
$$\frac{-15z}{-15} \leq \frac{-75}{-15}$$
$$z \leq 5$$

Therefore, the solution set represents as $\boxed{\{z \mid z \leq 5\}}$.

In order to check the solution consider $z = 4$

Substitute $z = 4$ in the given inequality

$$-15z \geq -75$$
$$-15 \times 4 \geq -75$$
$$-60 \geq -75$$

The value of $z = 4$ satisfies the given inequality.

Now consider $z = 6$

Substitute $z = 6$ in the given inequality

$$-15z \geq -75$$
$$-15 \times 6 \geq -75$$
$$-90 \geq -75$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{z \mid z \leq 5\}$.

Answer 20PT.

Consider the following inequality:

$|2a-5|<7$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|<n$, then $a<n$ and $a>-n$

In this case the inequality is expressed as

$2a-5<7$ or $2a-5>-7$

Consider the first inequality.

$2a-5<7$

Simplify the inequality by adding 2 on both sides.

$$2a-5<7$$
$$2a-5+5<7+5$$
$$2a<12$$

Further simplify by dividing both sides with 2.

$$2a<12$$
$$\frac{2a}{2}<\frac{12}{2}$$
$$a<6$$

Hence, the solution for first inequality is $a<6$.

Now consider the second inequality.

$2a-5>-7$

Simplify the inequality by adding 5 on both sides.

$$2a-5>-7$$
$$2a-5+5>-7+5$$
$$2a>-2$$

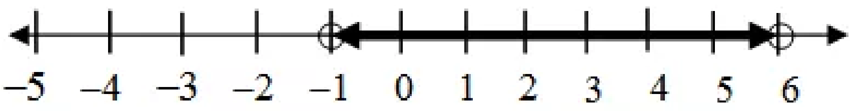
Further simplify by dividing both sides with 2.

$$2a > -2$$
$$\frac{2a}{2} > \frac{-2}{2}$$
$$a > -1$$

Hence, the solution for second inequality is $a > -1$.

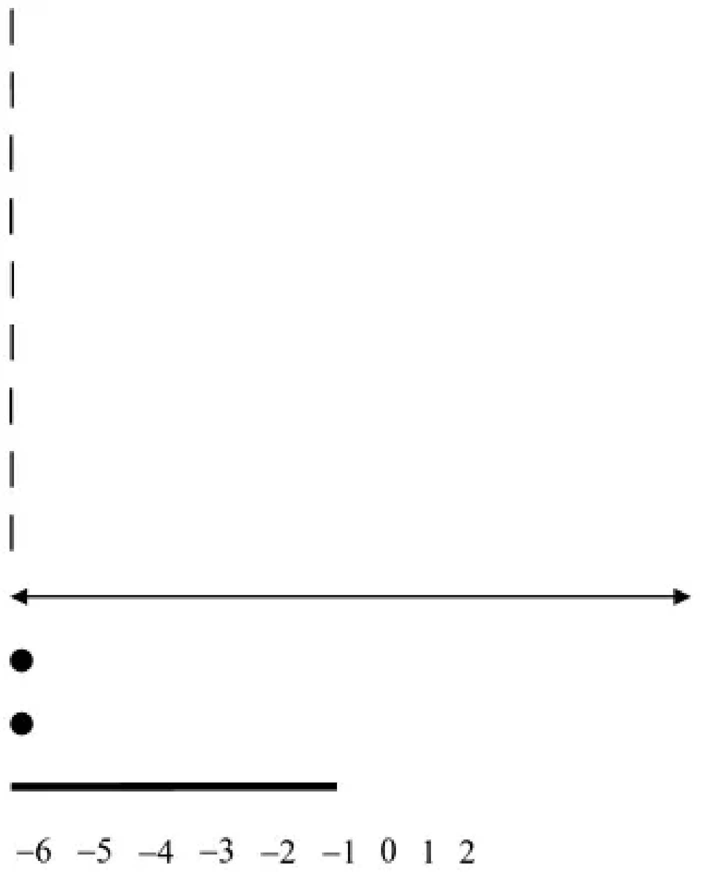
Therefore, the solution set is represented as $\boxed{\{a \mid -1 < a < 6\}}$.

Graph the solution as follows:



Answer 20STP.

Consider the following graph.



The objective is to show the above graph in absolute form.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a| < n$, then $a < n$ and $a > -n$

The above graph mentions the value of any number is less than or equal to 1 and greater than or equal to -5.

Dotted circles indicate the values are also included in the inequality.

Consider *t* as the number.

The number is less than or equal to 1.

i.e $t \leq 1$

And the number is greater than or equal to -5.

i.e $t \geq -5$

Hence, the combined set is represented as $\{t \mid -5 \leq t \leq 1\}$.

This can be expressed in absolute form as $\boxed{|t+2| \leq 3}$.

Answer 21E.

Consider the following inequality:

$$-9m < 99$$

The objective is to solve the inequality and check the solution.

Whenever a true inequality is multiplied or divided by a negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by dividing both sides by -9 and change the inequality symbol.

The inequalities can be expressed as

$$-9m < 99$$
$$\frac{-9m}{-9} > \frac{99}{-9}$$
$$m > -11$$

Therefore, the solution set represents as $\boxed{\{m \mid m > -11\}}$.

In order to check the solution consider $m=-10$

Substitute $m=-10$ in the given inequality

$-9m<99$

$-9\times -10<99$

$90<99$

The value of $m=-10$ satisfies the given inequality.

Now consider $m=-12$

Substitute $m=-12$ in the given inequality

$-9m<99$

$-9\times -12<99$

$108 \not< 99$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{m \mid m>-11\}$.

Answer 21PT.

Consider the following inequality:

$|7-3s|\geq 2$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|>n$, then $a<-n$ or $a>n$

In this case the inequality is expressed as

$7-3s\geq 2$ or $7-3s\leq -2$

First consider the first inequality.

$7-3s\geq 2$

Simplify the inequality by subtracting 7 on both sides.

$7-3s\geq 2$

$7-3s-7\geq 2-7$

$-3s\geq -5$

Further simplify by dividing both sides with -3 and change the inequality sign.

$$-3s \ge -5$$
$$\frac{-3s}{-3} \le \frac{-5}{-3}$$
$$s \le \frac{5}{3}$$

Hence, the solution for first inequality is $s \le \frac{5}{3}$.

Now consider the second inequality.

$$7 - 3s \le -2$$

Simplify the inequality by subtracting 7 on both sides.

$$7 - 3s \le -2$$
$$7 - 3s - 7 \le -2 - 7$$
$$-3s \le -9$$

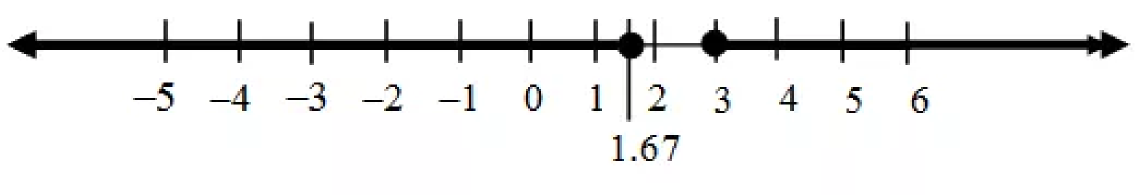
Further simplify by dividing both sides with -3 and change the inequality sign.

$$-3s \le -9$$
$$\frac{-3s}{-3} \ge \frac{-9}{-3}$$
$$s \ge 3$$

Hence, the solution for second inequality is $s \ge 3$.

Therefore, the solution set is represented as $\boxed{\{s \mid 1.67 \ge s \ge 3\}}$.

Graph the solution as follows:



Answer 22E.

Consider the following inequality:

$$\frac{b}{-12} \leq 3$$

The objective is to solve the inequality and check the solution.

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by multiplying both sides by -12 and change the inequality symbol.

The inequalities can be expressed as

$$\frac{b}{-12} \leq 3$$
$$\frac{b}{-12} \times -12 \geq 3 \times -12$$
$$b \geq -36$$

Therefore, the solution set represents as $\boxed{\{b \mid b \geq -36\}}$.

In order to check the solution consider $b = -36$

Substitute $b = -36$ in the given inequality

$$\frac{b}{-12} \leq 3$$
$$\frac{-36}{-12} \leq 3$$
$$3 \leq 3$$

The value of $b = -36$ satisfies the given inequality.

Now consider $b = -48$

Substitute $b = -48$ in the given inequality

$$\frac{b}{-12} \leq 3$$
$$\frac{-48}{-12} \leq 3$$
$$4 \not\leq 3$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{b \mid b \geq -36\}$.

Answer 22PT.

Consider the following inequality:

$$|7-5z|>3$$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|>n$, then $a<-n$ or $a>n$

In this case the inequality is expressed as

$7-5z>3$ or $7-5z<-3$

First consider the first inequality.

$$7-5z>3$$

Simplify the inequality by subtracting 7 on both sides.

$$7-5z>3$$
$$7-5z-7>3-7$$
$$-5z>-4$$

Further simplify by dividing both sides with -5 and change the inequality sign.

$$-5z>-4$$
$$\frac{-5z}{-5}<\frac{-4}{-5}$$
$$z<\frac{4}{5}$$
$$z<0.8$$

Hence, the solution for first inequality is $z<0.8$.

Now consider the second inequality.

$$7-5z<-3$$

Simplify the inequality by subtracting 7 on both sides.

$$7-5z<-3$$
$$7-5z-7<-3-7$$
$$-5z<-10$$

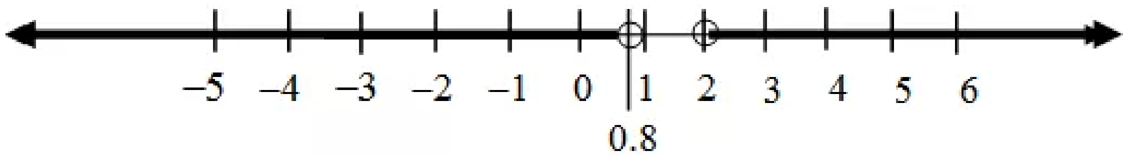
Further simplify by dividing both sides with -5 and change the inequality sign.

$$-5z < -10$$
$$\frac{-5z}{-5} > \frac{-10}{-5}$$
$$z > 2$$

Hence, the solution for second inequality is $z > 2$.

Therefore, the solution set is represented as $\boxed{\{s \mid 0.8 > z > 2\}}$.

Graph the solution as follows:



Answer 23E.

Consider the following inequality:

$$\frac{d}{-13} > -5$$

The objective is to solve the inequality and check the solution.

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by multiplying both sides by -13 and change the inequality symbol.

The inequalities can be expressed as

$$\frac{d}{-13} > -5$$
$$\frac{d}{-13} \times -13 < -5 \times -13$$
$$d < 65$$

Therefore, the solution set represents as $\boxed{\{d \mid d < 65\}}$.

In order to check the solution consider $d = 52$

Substitute $d = 52$ in the given inequality

$$\frac{d}{-13} > -5$$
$$\frac{52}{-13} > -5$$
$$-4 > -5$$

The value of $d = 52$ satisfies the given inequality.

Now consider $d = 78$

Substitute $d = 78$ in the given inequality

$$\frac{d}{-13} > -5$$
$$\frac{78}{-13} > -5$$
$$-6 \not> -5$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{d \mid d < 65\}$.

Answer 23PT.

The objective is to write the inequality for the given sentence.

Consider the number as *n*, one fourth of a number is no less than (greater than or equal to) -3.

This can be expressed as following inequality

$$\frac{1}{4}n \geq -3$$

Simplify the given expression by multiplying 4 on both sides.

$$\frac{1}{4}n \geq -3$$
$$\frac{1}{4}n \times 4 \geq -3 \times 4$$
$$n \geq -12$$

The solution set is represented as $\boxed{\{n \mid n \geq -12\}}$.

In order to check the solution consider $n = -12$

Substitute $n = -12$ in the given inequality

$$\frac{1}{4}n \geq -3$$
$$\frac{1}{\cancel{4}} \times -1\overset{3}{\cancel{2}} \geq -3 \quad \text{True}$$
$$-3 \geq -3$$

The value of $n = -12$ satisfies the given inequality.

In order to check the solution consider $n=-16$

Substitute $n=-16$ in the given inequality

$$\frac{1}{4}n \geq -3$$

$$\frac{1}{\cancel{4}} \times -\overset{4}{\cancel{16}} \geq -3 \quad \text{False}$$

$$-4 \ngeq -3$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{n \mid n \geq -12\}$.

Answer 24E.

Consider the following inequality:

$$\frac{2}{3}w > -22$$

The objective is to solve the inequality and check the solution.

Simplify the inequality by multiplying both sides by 3/2.

The inequalities can be expressed as

$$\frac{2}{3}w > -22$$

$$\frac{\cancel{2}}{\cancel{3}}w \times \frac{\cancel{3}}{\cancel{2}} > -\overset{11}{\cancel{22}} \times \frac{3}{\cancel{2}}$$

$$w > -33$$

Therefore, the solution set represents as $\boxed{\{w \mid w > -33\}}$.

In order to check the solution consider $w=-30$

Substitute $w=-30$ in the given inequality

$$\frac{2}{3}w > -22$$

$$\frac{2}{3} \times -30 > -22$$

$$-20 > -22$$

The value of $w=-30$ satisfies the given inequality.

Now consider $w = -36$

Substitute $w = -36$ in the given inequality

$$\frac{2}{3}w > -22$$

$$\frac{2}{\cancel{3}} \times -\overset{12}{\cancel{36}} > -22$$

$$-24 \not> -22$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{w \mid w > -33\}$.

Answer 24PT.

The objective is to write the inequality for the given sentence.

Consider the number as *n*, three times a number minus 14 is less than 2.

This can be expressed as following inequality

$$3n - 14 < 2$$

Simplify the given expression by adding 14 on both sides.

$$3n - 14 < 2$$

$$3n - 14 + 14 < 2 + 14$$

$$3n < 16$$

Further simplify by dividing both sides with 3.

$$3n < 16$$

$$\frac{3n}{3} < \frac{16}{3}$$

$$n < \frac{16}{3}$$

The solution set is represented as $\boxed{\{n \mid n < \frac{16}{3}\}}$.

In order to check the solution consider $n = 5$

Substitute $n = 5$ in the given inequality

$$3n - 14 < 2$$

$$3 \times 5 - 14 < 2$$

$$15 - 14 < 2$$

$$1 < 2$$

True

The value of $n = -12$ satisfies the given inequality.

In order to check the solution consider $n=6$

Substitute $n=6$ in the given inequality

$$3n-14<2$$
$$3\times6-14<2$$
$$18-14<2$$
$$4\not<2$$

False

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{n\,|\,n<\frac{16}{3}\}$.

Answer 25E.

Consider the following inequality:

$$\frac{3}{5}p\le-15$$

The objective is to solve the inequality and check the solution.

Simplify the inequality by multiplying both sides by 5/3.

The inequalities can be expressed as

$$\frac{3}{5}p\le-15$$
$$\frac{\cancel{3}}{\cancel{5}}p\times\frac{\cancel{5}}{\cancel{3}}\le-1\overset{5}{\cancel{5}}\times\frac{5}{\cancel{3}}$$
$$p\le-25$$

Therefore, the solution set represents as $\boxed{\{p\,|\,p\le-25\}}$.

In order to check the solution consider $p=-25$

Substitute $p=-25$ in the given inequality

$$\frac{3}{5}p\le-15$$
$$\frac{3}{\cancel{5}}\times-2\overset{5}{\cancel{5}}\le-15$$
$$-15\le-15$$

The value of $p=-25$ satisfies the given inequality.

Now consider $p = -20$

Substitute $p = -20$ in the given inequality

$$\frac{3}{5}p \le -15$$
$$\frac{3}{\cancel{5}} \times -2\overset{4}{\cancel{0}} \le -15$$
$$-12 \not\le -15$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{p \mid p \le -25\}$.

Answer 25PT.

The objective is to write the inequality for the given sentence.

Consider the number as *n*, five less than a twice a number is between 13 and 21.

This can be expressed as following inequality

$$13 < 2n - 5 > 21$$

Simplify the given expression by adding 5 on both sides.

$$13 < 2n - 5 > 21$$
$$13 + 5 < 2n - 5 + 5 > 21 + 5$$
$$18 < 2n > 26$$

Further simplify both sides by dividing with 2.

$$18 < 2n > 26$$
$$\frac{18}{2} < \frac{2n}{2} > \frac{26}{2}$$
$$9 < n > 13$$

The solution set is represented as $\boxed{9 < n > 13}$.

This states that the number *n* is greater than 9 and less than 13.

Answer 26E.

The objective is to write the inequality for the given sentence.

Consider the number as *n*, eight percent of a number is greater than or equal to 24.

This can be expressed as following inequality

$$\frac{8}{100}n \ge 24$$

Simplify the given expression by multiplying 100/8 on both sides.

$$\frac{8}{100}n \geq 24$$
$$\frac{8}{100}n \times \frac{100}{8} \geq \overset{3}{\cancel{24}} \times \frac{100}{\cancel{8}}$$
$$n \geq 300$$

The number is greater than or equal to 300.

The solution set is represented as $\boxed{\{n \mid n \geq 300\}}$.

In order to check the solution consider $n = 300$

Substitute $n = 300$ in the given inequality

$$\frac{8}{100}n \geq 24$$
$$\frac{8}{100} \times 300 \geq 24$$
$$24 \geq 24$$

The value of $n = 300$ satisfies the given inequality.

In order to check the solution consider $n = 200$

Substitute $n = 200$ in the given inequality

$$\frac{8}{100}n \geq 24$$
$$\frac{8}{100} \times 200 \geq 24$$
$$16 \ngeq 24$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{n \mid n \geq 300\}$.

Answer 26PT.

The objective is to find the distance that Megan car travelled.

The mileage for Megan's car is between 18 and 21 miles.

The capacity of the car tank is 15 gallons.

So the distance is expressed as

$$\text{distance} = \text{no of litres} \times \text{miles}$$

For 18 miles the distance is

$$\text{distance} = 15 \times 18$$
$$= 270 \text{ miles}$$

For 21 miles the distance is

$$\text{distance} = 15 \times 21$$
$$= 315 \text{ miles}$$

Therefore, the distance travelled is $\boxed{270 \text{ miles}, 315 \text{ miles}}$.

Answer 27E.

Consider the following inequality

$$-4h + 7 > 15$$

The objective is to solve the inequality and check the solution.

Simplify the above inequality by subtracting 7 on both sides.

$$-4h + 7 > 15$$
$$-4h + 7 - 7 > 15 - 7$$
$$-4h > 8$$

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by dividing both sides by -4 and change the inequality symbol.

$$-4h > 8$$
$$\frac{-4h}{-4} < \frac{8}{-4}$$
$$h < -2$$

Therefore, the solution set represents as $\boxed{\{h \mid h < -2\}}$.

In order to check the solution consider $h = -3$

Substitute $h = -3$ in the given inequality

$$-4h + 7 > 15$$
$$-4 \times -3 + 7 > 15$$
$$12 + 7 > 15$$
$$19 > 15$$

The value of $h = -3$ satisfies the given inequality.

Now consider $h = -1$

Substitute $h = -1$ in the given inequality

$-4h + 7 > 15$

$-4 \times -1 + 7 > 15$

$4 + 7 > 15$

$11 \not> 15$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{h \mid h < -2\}$.

Answer 27PT.

The objective is to graph the inequality.

Consider the following inequality:

$y \geq 3x - 2$

First step is to change the inequality to an equation.

$y = 3x - 2$

Start with set of values for *x*, substituting different values will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x = 0$

$y = 3 \times 0 - 2$

$y = -2$

Hence, the point is $(0, -2)$.

Consider $x = 1$

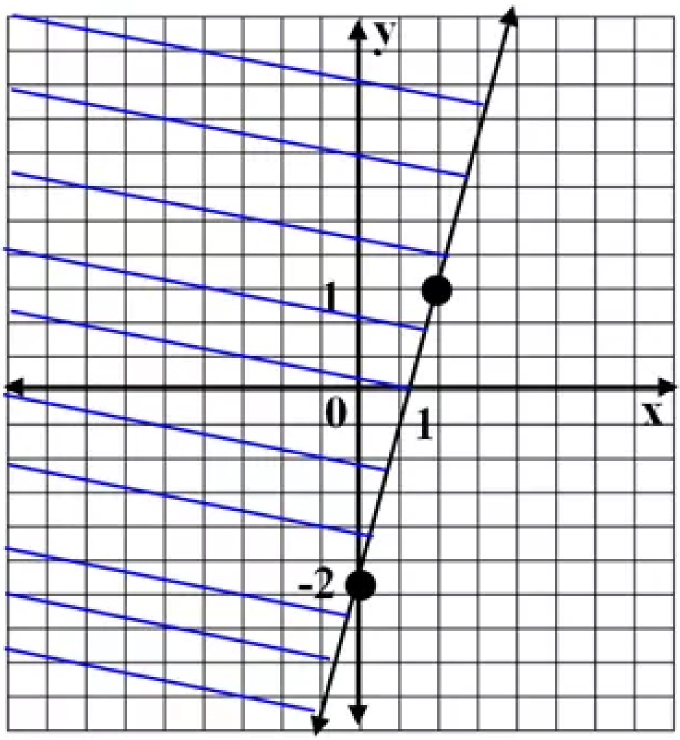
$y = 3 \times 1 - 2$

$y = 1$

Hence, the point is $(1, 1)$.

Draw a solid line passing through the above points. Since $y \geq$, shade above the line.

Hence, $y \geq 3x - 2$ is shown as:



Answer 28E.

Consider the following inequality

$$5 - 6n > -19$$

The objective is to solve the inequality and check the solution.

Simplify the above inequality by subtracting 5 on both sides.

$$5 - 6n > -19$$
$$5 - 6n - 5 > -19 - 5$$
$$-6n > -24$$

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by dividing both sides by -6 and change the inequality symbol.

$$-6n > -24$$
$$\frac{-6n}{-6} < \frac{-24}{-6}$$
$$n < 4$$

Therefore, the solution set represents as $\boxed{\{n \mid n < 4\}}$.

In order to check the solution consider $n=3$

Substitute $n=3$ in the given inequality

$$5-6n>-19$$
$$5-6\times 3>-19$$
$$5-18>-19$$
$$-13>-19$$

The value of $n=3$ satisfies the given inequality.

Now consider $n=5$

Substitute $n=5$ in the given inequality

$$5-6n>-19$$
$$5-6\times 5>-19$$
$$5-30>-19$$
$$-25 \not> -19$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{n \mid n<4\}$.

Answer 29PT.

The objective is to graph the inequality.

Consider the following inequality:

$$2x+3y<6$$

First step is to change the inequality to an equation.

$$2x+3y=6$$

Express the above equation in slope intercept form $y = mx + c$

$$2x + 3y = 6$$
$$3y = -2x + 6$$
$$y = -\frac{2}{3}x + \frac{6}{3}$$
$$y = -\frac{2}{3}x + 2$$

Start with set of values for *x*, substituting different values will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x = 0$

$$y = \frac{-2}{3} \times 0 + 2$$
$$y = 2$$

Hence, the point is $(0,2)$.

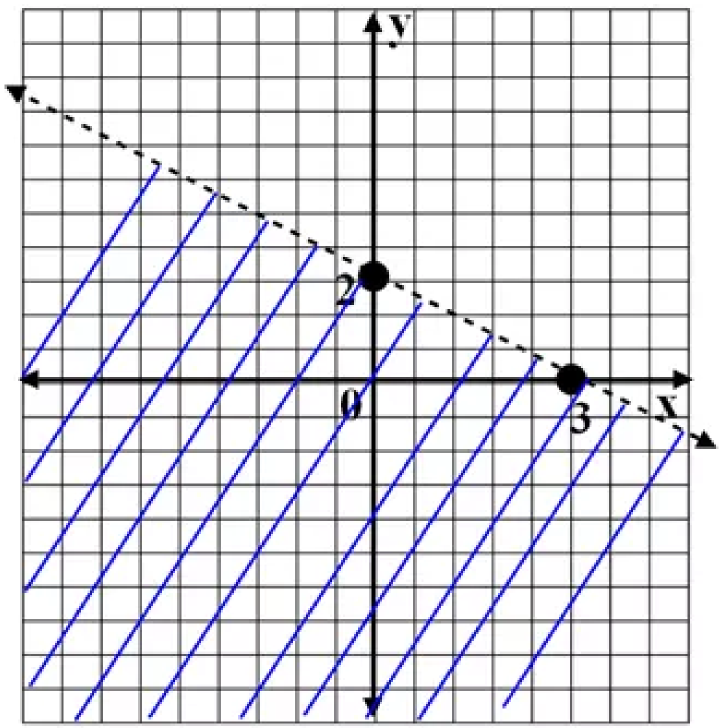
Consider $x = 3$

$$y = -\frac{2}{3} \times 3 + 2$$
$$y = 0$$

Hence, the point is $(3,0)$.

Draw a dotted line passing through the above points. Since $y <$, shade below the line

Therefore, $2x + 3y < 6$ is shown as:



Answer 29E.

Consider the following inequality

$-5x+3<3x+19$

The objective is to solve the inequality and check the solution.

Simplify the above inequality by subtracting *3x* on both sides.

$$-5x+3<3x+19$$
$$-5x+3-3x<3x+19-3x$$
$$-8x+3<19$$

Further simplify the above inequality by subtracting 3 on both sides

$$-8x+3<19$$
$$-8x+3-3<19-3$$
$$-8x<16$$

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by dividing both sides by -8 and change the inequality symbol.

$$-8x<16$$
$$\frac{-8x}{-8}>\frac{16}{-8}$$
$$x>-2$$

Therefore, the solution set represents as $\boxed{\{x \mid x>-2\}}$.

In order to check the solution consider $x=-1$

Substitute $x=-1$ in the given inequality

$$-5x+3<3x+19$$
$$-5\times-1+3<3\times-1+19$$
$$5+3<-3+19$$
$$8<16$$

The value of $x=-1$ satisfies the given inequality.

Now consider $x=-3$

Substitute $x=-3$ in the given inequality

$$-5x+3<3x+19$$
$$-5\times-3+3<3\times-3+19$$
$$15+3<-9+19$$
$$18 \not< 10$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{x \mid x>-2\}$.

Answer 29PT.

The objective is to graph the inequality.

Consider the following inequality:

$x-2y>4$

First step is to change the inequality to an equation.

$x-2y=4$

Express the above equation in slope intercept form $y=mx+c$

$$x-2y=4$$
$$2y=x-4$$
$$y=\frac{1}{2}x-\frac{4}{2}$$
$$y=\frac{1}{2}x-2$$

Start with set of values for *x*, substituting different values will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x=0$

$$y=\frac{1}{2}x-2$$
$$y=\frac{1}{2}\times 0-2$$
$$y=-2$$

Hence, the point is $(0,-2)$.

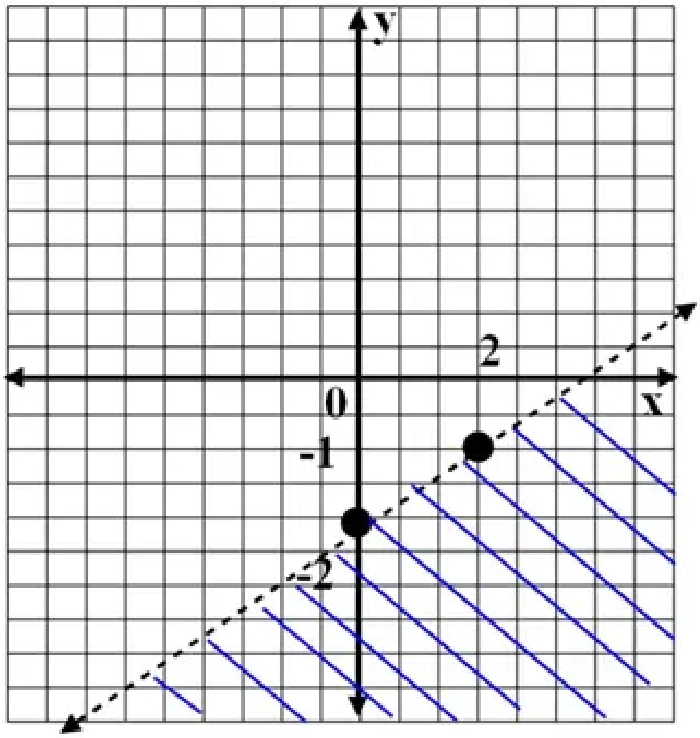
Consider $x=2$

$$y=\frac{1}{2}x-2$$
$$y=\frac{1}{2}\times 2-2$$
$$y=-1$$

Hence, the point is $(2,-1)$.

Draw a dotted line passing through the above points. Since $y <$, shade below the line

Therefore, $y < \frac{1}{2}x - 2$ is shown as:



Answer 30E.

Consider the following inequality

$15b - 12 > 7b + 60$

The objective is to solve the inequality and check the solution.

Simplify the above inequality by subtracting *7b* on both sides.

$15b - 12 > 7b + 60$

$15b - 12 - 7b > 7b + 60 - 7b$

$8b - 12 > 60$

Further simplify the above inequality by adding 12 on both sides.

$8b-12>60$

$8b-12+12>60+12$

$8b>72$

Simplify the inequality by dividing both sides by 8.

$8b>72$

$\frac{8b}{8}>\frac{72}{8}$

$b>9$

Therefore, the solution set represents as $\boxed{\{b \mid b>9\}}$.

In order to check the solution consider $b=10$

Substitute $b=10$ in the given inequality

$15b-12>7b+60$

$15\times10-12>7\times10+60$

$150-12>70+60$

$138>130$

The value of $b=10$ satisfies the given inequality.

Now consider $b=8$

Substitute $b=8$ in the given inequality

$15b-12>7b+60$

$15\times8-12>7\times8+60$

$120-12>56+60$

$108 \not> 116$

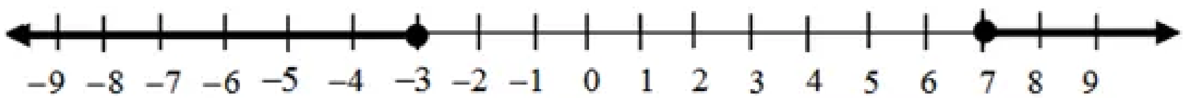
This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{b \mid b>9\}$.

Answer 30PT.

The objective is to find the inequality based on the graph shown.

Consider the following graph:



The graph can be represented as $x\geq7$ and $x\leq-3$

(a) Consider the following inequality:

$|x-2|\leq5$

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|<n$, then $a<n$ and $a>-n$

In this case the inequality is expressed as

$x-2\le 5$ and $x-2\ge -5$

First consider the first inequality.

$x-2\le 5$

Simplify the inequality by adding 2 on both sides.

$$x-2\le 5$$
$$x-2+2\le 5+2$$
$$x\le 7$$

Hence, the solution for first inequality is $x\le 7$.

Now consider the second inequality.

$x-2\ge -5$

Simplify the inequality by adding 2 on both sides.

$$x-2\ge -5$$
$$x-2+2\ge -5+2$$
$$x\ge -3$$

Hence, the solution for second inequality is $x\ge -3$.

Therefore, the solution set is represented as $\{x\,|\,-3\le x\le 7\}$.

This doesn't satisfy the graph.

(b) Consider the following inequality:

$|x-2|\ge 5$

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|>n$, then $a>n$ or $a<-n$

In this case the inequality is expressed as

$x-2\ge 5$ or $x-2\le -5$

First consider the first inequality.

$x-2\ge 5$

Simplify the inequality by adding 2 on both sides.

$$x-2\ge 5$$
$$x-2+2\ge 5+2$$
$$x\ge 7$$

Hence, the solution for first inequality is $x\ge 7$.

Now consider the second inequality.

$x-2\leq-5$

Simplify the inequality by adding 2 on both sides.

$$x-2\leq-5$$
$$x-2+2\leq-5+2$$
$$x\leq-3$$

Hence, the solution for second inequality is $x\leq-3$.

Therefore, the solution set is represented as $\boxed{\{x\mid -3\geq x\geq 7\}}$.

This satisfies the graph.

Therefore, the solution is ***B.***

(c) Consider the following inequality:

$|x+2|\leq 5$

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|<n$, then $a<n$ and $a>-n$

In this case the inequality is expressed as

$x+2\leq5$ and $x+2\geq-5$

First consider the first inequality.

$x+2\leq5$

Simplify the inequality by subtracting 2 on both sides.

$$x+2\leq5$$
$$x+2-2\leq5-2$$
$$x\leq3$$

Hence, the solution for first inequality is $x\leq3$.

Now consider the second inequality.

$x+2\geq-5$

Simplify the inequality by subtracting 2 on both sides.

$$x+2\geq-5$$
$$x-2+2\geq-5-2$$
$$x\geq-7$$

Hence, the solution for second inequality is $x\geq-7$.

This doesn't satisfy the graph.

(d) Consider the following inequality:

$|x+2| \geq 5$

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a| > n$, then $a > n$ or $a < -n$

In this case the inequality is expressed as

$x+2 \geq 5$ or $x+2 \leq -5$

First consider the first inequality.

$x+2 \geq 5$

Simplify the inequality by subtracting 2 on both sides.

$$x+2 \geq 5$$
$$x-2+2 \geq 5-2$$
$$x \geq 3$$

Hence, the solution for first inequality is $x \geq 3$.

Now consider the second inequality.

$x+2 \leq -5$

Simplify the inequality by subtracting 2 on both sides.

$$x+2 \leq -5$$
$$x+2-2 \leq -5-2$$
$$x \leq -7$$

Hence, the solution for second inequality is $x \leq -7$.

This doesn't satisfy the graph.

Answer 31E.

Consider the following inequality

$-5(q+12) < 3q-4$

The objective is to solve the inequality and check the solution.

The grouped numbers can be simplified by using distributed property.

$$-5(q+12) < 3q-4$$
$$-5q-60 < 3q-4$$

Simplify the above inequality by subtracting *3q* on both sides.

$$-5q-60 < 3q-4$$
$$-5q-60-3q < 3q-4-3q$$
$$-8q-60 < -4$$

Further simplify the above inequality by adding 60 on both sides

$$-8q - 60 < -4$$
$$-8q - 60 + 60 < -4 + 60$$
$$-8q < 56$$

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by dividing both sides by -8 and change the inequality symbol.

$$-8q < 56$$
$$\frac{-8q}{-8} > \frac{56}{-8}$$
$$q > -7$$

Therefore, the solution set represents as $\boxed{\{q \mid q > -7\}}$.

In order to check the solution consider $q = -6$

Substitute $q = -6$ in the given inequality

$$-5(q + 12) < 3q - 4$$
$$-5(-6 + 12) < 3 \times -6 - 4$$
$$-5 \times 6 < -18 - 4$$
$$-30 < -22$$

The value of $q = -6$ satisfies the given inequality.

Now consider $q = -8$

Substitute $q = -8$ in the given inequality

$$-5(q + 12) < 3q - 4$$
$$-5(-8 + 12) < 3 \times -8 - 4$$
$$-5 \times 4 < -24 - 4$$
$$-20 \not< -28$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{q \mid q > -7\}$.

Answer 32E.

Consider the following inequality

$$7(g+8)<3(g+2)+4g$$

The objective is to solve the inequality and check the solution.

The grouped numbers can be simplified by using distributed property.

$$7(g+8)<3(g+2)+4g$$
$$7g+56<3g+6+4g$$

Combine the like terms

$$7g+56<3g+6+4g$$
$$7g+56<7g+6$$

Simplify the above inequality by subtracting *7g* on both sides.

$$7g+56<7g+6$$
$$7g+56-7g<7g+6-7g$$
$$56<6$$

This inequality cannot be solved, as the *g* terms get cancelled and the existing number doesn't satisfy the inequality. The solution set is empty set.

Hence, no solution exits.

Answer 33E.

Consider the following inequality

$$\frac{2(x+2)}{3}\geq 4$$

The objective is to solve the inequality and check the solution.

The grouped numbers can be simplified by using distributed property.

$$\frac{2(x+2)}{3}\geq 4$$
$$2x+4\geq 3\times 4$$
$$2x+4\geq 12$$

Simplify the above inequality by subtracting 4 on both sides.

$$2x+4 \geq 12$$
$$2x+4-4 \geq 12-4$$
$$2x \geq 8$$

Further simplify the above inequality by dividing by 2 on both sides

$$2x \geq 8$$
$$\frac{2x}{2} \geq \frac{8}{2}$$
$$x \geq 4$$

Therefore, the solution set represents as $\boxed{\{x \mid x \geq 4\}}$.

In order to check the solution consider $x=4$

Substitute $x=4$ in the given inequality

$$\frac{2(x+2)}{3} \geq 4$$
$$\frac{2(4+2)}{3} \geq 4$$
$$\frac{2 \times 6}{3} \geq 4$$
$$4 \geq 4$$

The value of $x=4$ satisfies the given inequality.

Now consider $x=3$

Substitute $x=3$ in the given inequality

$$\frac{2(x+2)}{3} \geq 4$$
$$\frac{2(3+2)}{3} \geq 4$$
$$\frac{2 \times 5}{3} \geq 4$$
$$\frac{10}{3} \not\geq 4$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{x \mid x \geq 4\}$.

Answer 34E.

Consider the following inequality

$$\frac{1-7n}{5} > 10$$

The objective is to solve the inequality and check the solution.

Simplify the above inequality by multiplying with 5 on both sides.

$$\frac{1-7n}{5} > 10$$
$$\frac{1-7n}{5} \times 5 > 10 \times 5$$
$$1-7n > 50$$

Further simplify the above inequality by adding 1 on both sides.

$$1-7n > 50$$
$$1-7n-1 > 50-1$$
$$-7n > 49$$

Whenever a true inequality is multiplied or divided by any negative number, the direction of the inequality symbol should be reversed.

Simplify the inequality by dividing both sides by -7 and change the inequality symbol.

$$-7n > 49$$
$$\frac{-7n}{-7} < \frac{49}{-7}$$
$$n < -7$$

Therefore, the solution set represents as $\boxed{\{n \mid n < -7\}}$.

In order to check the solution consider $n = -8$

Substitute $n = -8$ in the given inequality

$$\frac{1-7n}{5} > 10$$
$$\frac{1-7\times -8}{5} > 10$$
$$\frac{1+56}{5} > 10$$
$$\frac{57}{5} > 10$$

The value of $n = -8$ satisfies the given inequality.

Answer 35E.

The objective is to write the inequality for the given sentence.

Consider the number as *n*, two thirds of number decreased which is minus 27 is at least (greater than or equal to) 9.

This can be expressed as following inequality

$$\frac{2}{3}n-27\geq 9$$

Simplify the given expression by adding 27 on both sides.

$$\frac{2}{3}n-27\geq 9$$
$$\frac{2}{3}n-27+27\geq 9+27$$
$$\frac{2}{3}n\geq 36$$

Further simplify by multiplying both sides 3/2.

$$\frac{2}{3}n\geq 36$$
$$\frac{\cancel{2}}{\cancel{3}}n\times\frac{\cancel{3}}{\cancel{2}}\geq \overset{18}{3\cancel{6}}\times\frac{3}{\cancel{2}}$$
$$n\geq 54$$

The number is greater than or equal to 54.

The solution set is represented as $\boxed{\{n\mid n\geq 54\}}$.

In order to check the solution consider $n=54$

Substitute $n=54$ in the given inequality

$$\frac{2}{3}n-27\geq 9$$
$$\frac{2}{\cancel{3}}\times \overset{18}{5\cancel{4}}-27\geq 9$$
$$36-27\geq 9$$
$$9\geq 9$$

The value of $n=54$ satisfies the given inequality.

In order to check the solution consider $n = 48$

Substitute $n = 48$ in the given inequality

$$\frac{2}{3}n - 27 \geq 9$$

$$\frac{2}{\cancel{3}} \times \overset{16}{4\cancel{8}} - 27 \geq 9$$

$$32 - 27 \geq 9$$

$$5 \not\geq 9$$

This doesn't satisfy the given inequality.

Hence, always the solution set is represented as $\{n \mid n \geq 54\}$.

Answer 36E.

Consider the following inequality:

$$-1 < p + 3 < 5$$

The objective is to solve the inequality and graph the solution set.

First consider the first inequality.

$$-1 < p + 3$$

Simplify the inequality by subtracting 3 on both sides.

$$-1 < p + 3$$

$$-1 - 3 < p + 3 - 3$$

$$-4 < p$$

$$p > -4$$

Hence, the solution set represents as $\{p \mid p > -4\}$.

Now consider the second inequality.

$p+3<5$

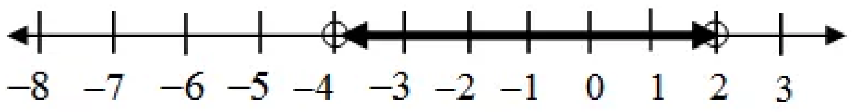
Simplify the inequality by subtracting 3 on both sides.

$$\begin{aligned} &p+3<5 \\ &p+3-3<5-3 \\ &p<2 \end{aligned}$$

Hence, the solution set represents as $\{p \mid p<2\}$.

Therefore, the solution set is presented as $\boxed{\{p \mid -4<p<2\}}$.

Graph the solution on the number line by showing the arrow between -4 and 2.



Answer 37E.

Consider the following inequality:

$-3<2k-1<5$

The objective is to solve the inequality and graph the solution set.

First consider the first inequality.

$-3<2k-1$

Simplify the inequality by adding 1 on both sides.

$$\begin{aligned} &-3<2k-1 \\ &-3+1<2k-1+1 \\ &-2<2k \end{aligned}$$

Further simplify by dividing both sides with 2.

$$\begin{aligned} &-2<2k \\ &\frac{-2}{2}<\frac{2k}{2} \\ &-1<k \\ &k>-1 \end{aligned}$$

Hence, the solution set represented for first inequality is $\{k \mid k>-1\}$.

Now consider the second inequality.

$$2k-1<5$$

Simplify the inequality by adding 1 on both sides.

$$2k-1<5$$
$$2k-1+1<5+1$$
$$2k<6$$

Further simplify by dividing both sides with 2.

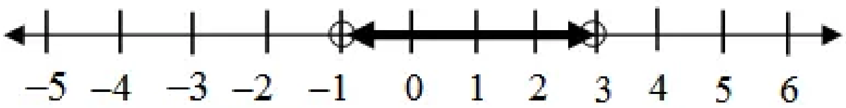
$$2k<6$$
$$\frac{2k}{2}<\frac{6}{2}$$
$$k<3$$

Hence, the solution set represented for second inequality is $\{k \mid k<3\}$.

Combine both the sets.

Therefore, the solution set is presented as $\boxed{\{k \mid -1<k<3\}}$.

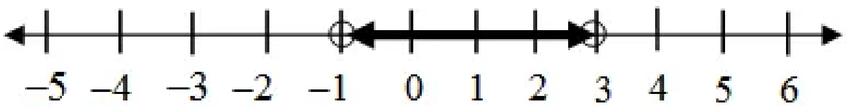
Graph the solution on the number line by showing the arrow between -1 and 3.



Combine both the sets.

Therefore, the solution set is presented as $\boxed{\{k \mid -1<k<3\}}$.

Graph the solution on the number line by showing the arrow between -1 and 3.



Answer 38E.

Consider the following inequality:

$3w+8<2$ Or $w+12>2-w$

The objective is to solve the inequality and graph the solution set.

First consider the first inequality.

$$3w+8<2$$

Simplify the inequality by subtracting 8 on both sides.

$$3w+8<2$$
$$3w+8-8<2-8$$
$$3w<-6$$

Further simplify by dividing both sides with 3.

$$3w<-6$$
$$\frac{3w}{3}<\frac{-6}{3}$$
$$w<-2$$

Hence, the solution set represented for first inequality is $\{w \mid w<-2\}$.

Now consider the second inequality.

$$w+12>2-w$$

Simplify the inequality by adding *w* on both sides.

$$w+12>2-w$$
$$w+12+w>2-w+w$$
$$2w+12>2$$

Further simplify by subtracting with 12 and then divide it by 2 on both sides.

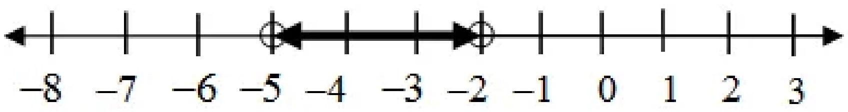
$$2w+12>2$$
$$2w+12-12>2-12 \quad \text{Divide by 2.}$$
$$2w>-10$$
$$w>-5$$

Hence, the solution set represented for second inequality is $\{w \mid w>-5\}$.

The union of the numbers $w<-2$ or $w>-5$

Therefore, the solution set is presented as $\boxed{\{w \mid -5<w<-2\}}$.

Graph the solution on the number line by showing the arrow between -5 and -2.



Answer 39E.

Consider the following inequality:

$$a-3\le 8 \text{ or } a+5\ge 21$$

The objective is to solve the inequality and graph the solution set.

First consider the first inequality.

$$a-3\le 8$$

Simplify the inequality by adding 3 on both sides.

$a-3\le 8$

$a-3+3\le 8+3$

$a\le 11$

Hence, the solution set represented for first inequality is $\{a\mid a\le 11\}$.

Now consider the second inequality.

$a+5\ge 21$

Simplify the inequality by subtracting 5 on both sides.

$a+5\ge 21$

$a+5-5\ge 21-5$

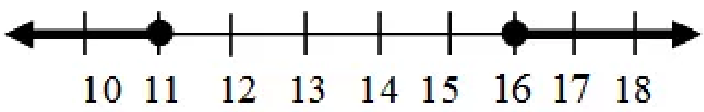
$a\ge 16$

Hence, the solution set represented for second inequality is $\{a\mid a\ge 16\}$.

The union set of numbers $a\le 11$, $a\ge 16$

Therefore, the solution set is presented as $\boxed{a\le 11 \text{ or } a\ge 16}$.

Graph the solution on the number line by showing the left of 11 and right of 16.



Answer 40E.

Consider the following inequality:

$m+8<4$ and $3-m<5$

The objective is to solve the inequality and graph the solution set.

First consider the first inequality.

$m+8<4$

Simplify the inequality by subtracting 8 on both sides.

$m+8<4$

$m+8-8<4-8$

$m<-4$

Hence, the solution set represented for first inequality is $\{m\mid m<-4\}$.

Now consider the second inequality.

$3 - m < 5$

Simplify the inequality by subtracting 3 on both sides.

$$3 - m < 5$$
$$3 - m - 3 < 5 - 3$$
$$-m < 2$$

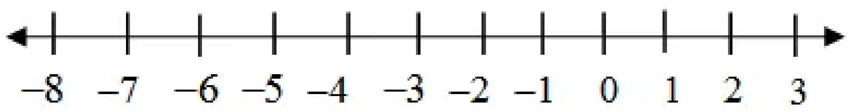
Further multiply with -1 and change the inequality symbol.

$$-m < 2$$
$$-1 \times -m > 2 \times -1$$
$$m > -2$$

Hence, the solution set represented for second inequality is $\{m \mid m > -2\}$.

The intersection of the numbers $m < -4$ and $m > -2$. There is no overlap in the numbers from the number line.

Therefore, the solution set is empty.



Answer 41E.

Consider the following inequality:

$10 - 2y > 12$ and $7y < 4y + 9$

The objective is to solve the inequality and graph the solution set.

Consider the first inequality.

$10 - 2y > 12$

Simplify the inequality by subtracting 10 on both sides.

$$10 - 2y > 12$$
$$10 - 2y - 10 > 12 - 10$$
$$-2y > 2$$

Further simplify by dividing both sides with -2 and change the inequality symbol.

$$-2y > 2$$
$$\frac{-2y}{-2} < \frac{2}{-2}$$
$$y < -1$$

Hence, the solution set represented for first inequality is $\{y \mid y < -1\}$.

Now consider the second inequality.

$7y < 4y + 9$

Simplify the inequality by subtracting *4y* on both sides.

$7y < 4y + 9$
$7y - 4y < 4y + 9 - 4y$
$3y < 9$

Further simplify by dividing both sides with 3.

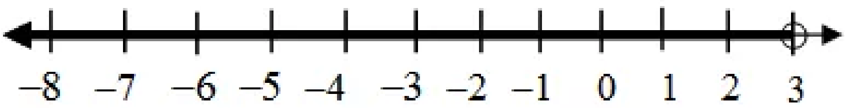
$3y < 9$
$\frac{3y}{3} < \frac{9}{3}$
$y < 3$

Hence, the solution set represented for second inequality is $\{y \mid y < 3\}$.

The intersection of the numbers $y < 3$ and $y < -1$.

Therefore, the solution set is presented as $\boxed{\{y \mid -1 > y > 3\}}$.

This can be graph as the numbers that are less than 3.



Answer 42E.

Consider the following relation:

$|w - 8| = 12$

The objective is to solve the equation and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

The absolute value of $|a| = a$ or $|a| = -a$

In this case the equation is expressed as

$w - 8 = 12$ or $w - 8 = -12$

First consider the first relation.

$w - 8 = 12$

Simplify the equation by adding 8 on both sides.

$w - 8 = 12$
$w - 8 + 8 = 12 + 8$
$w = 20$

Hence, the solution for first equation is $w = 20$.

Now consider the second equation.

$$w-8=-12$$

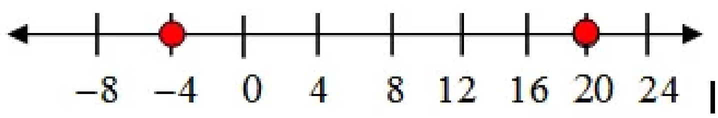
Simplify the equation by adding 8 on both sides.

$$w-8=-12$$
$$w-8+8=-12+8$$
$$w=-4$$

Hence, the solution for second equation is $w=-4$.

Therefore, the solution set is represented as $\boxed{\{-4,20\}}$.

Graph the solution as follows:



Answer 43E.

Consider the following relation:

$$|q+5|=2$$

The objective is to solve the equation and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

The absolute value of $|a|=a$ or $|a|=-a$

In this case the equation is expressed as

$q+5=2$ or $q+5=-2$

First consider the first relation.

$$q+5=2$$

Simplify the equation by subtracting 5 on both sides.

$$q+5=2$$
$$q+5-5=2-5$$
$$q=-3$$

Hence, the solution for first equation is $q=-3$.

Now consider the second equation.

$$q+5=-2$$

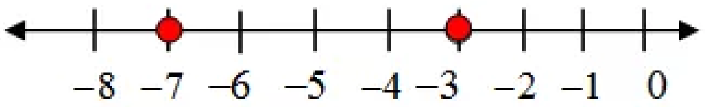
Simplify the equation by subtracting 5 on both sides.

$$q+5=-2$$
$$q+5-5=-2-5$$
$$q=-7$$

Hence, the solution for second equation is $q=-7$.

Therefore, the solution set is represented as $\boxed{\{-7,-3\}}$.

Graph the solution as follows:



Answer 44E.

Consider the following inequality:

$$|h+5|>7$$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|>n$, then $a<-n$ or $a>n$

In this case the inequality is expressed as

$h+5>7$ or $h+5<-7$

First consider the first inequality.

$$h+5>7$$

Simplify the inequality by subtracting 5 on both sides.

$$h+5>7$$
$$h+5-5>7-5$$
$$h>2$$

Hence, the solution for first inequality is $h>2$.

Now consider the second inequality.

$h+5<-7$

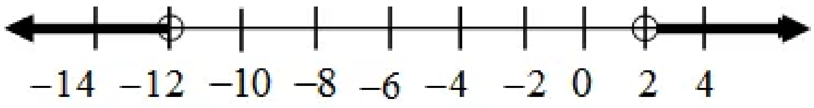
Simplify the inequality by subtracting 5 on both sides.

$$h+5<-7$$
$$h+5-5<-7-5$$
$$h<-12$$

Hence, the solution for second inequality is $h<-12$.

Therefore, the solution set is represented as $\boxed{\{h \mid -12>h>2\}}$.

Graph the solution as follows:



Answer 45E.

Consider the following inequality:

$|w+8|\geq 1$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|>n$, then $a<-n$ or $a>n$

In this case the inequality is expressed as

$w+8\geq 1$ or $w+8\leq -1$

First consider the first inequality.

$w+8\geq 1$

Simplify the inequality by subtracting 8 on both sides.

$$w+8\geq 1$$
$$w+8-8\geq 1-8$$
$$w\geq -7$$

Hence, the solution for first inequality is $w\geq -7$.

Now consider the second inequality.

$w+8 \le -1$

Simplify the inequality by subtracting 8 on both sides.

$$w+8 \le -1$$
$$w+8-8 \le -1-8$$
$$w \le -9$$

Hence, the solution for second inequality is $w \le -9$.

Therefore, the solution set is represented as $\boxed{\{w \mid -9 \ge w \ge -7\}}$.

Graph the solution as follows:

Answer 46E.

Consider the following inequality:

$|r+10| < 3$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a| < n$, then $a < n$ and $a > -n$

In this case the inequality is expressed as

$r+10 < 3$ or $r+10 > -3$

First consider the first inequality.

$r+10 < 3$

Simplify the inequality by subtracting 10 on both sides.

$$r+10 < 3$$
$$r+10-10 < 3-10$$
$$r < -7$$

Hence, the solution for first inequality is $r < -7$.

Now consider the second inequality.

$r + 10 > -3$

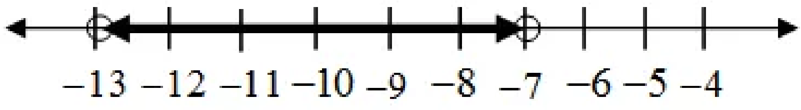
Simplify the inequality by subtracting 10 on both sides.

$$r + 10 > -3$$
$$r + 10 - 10 > -3 - 10$$
$$r > -13$$

Hence, the solution for second inequality is $r > -13$.

Therefore, the solution set is represented as $\boxed{\{r \mid -13 < r < -7\}}$.

Graph the solution as follows:



Answer 47E.

Consider the following inequality:

$|t + 4| \leq 3$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a| < n$, then $a < n$ and $a > -n$

In this case the inequality is expressed as

$t + 4 \leq 3$ and $t + 4 \geq -3$

First consider the first inequality.

$t + 4 \leq 3$

Simplify the inequality by subtracting 4 on both sides.

$$t + 4 \leq 3$$
$$t + 4 - 4 \leq 3 - 4$$
$$t \leq -1$$

Hence, the solution for first inequality is $t \leq -1$.

Now consider the second inequality.

$t+4\geq -3$

Simplify the inequality by subtracting 4 on both sides.

$t+4\geq -3$

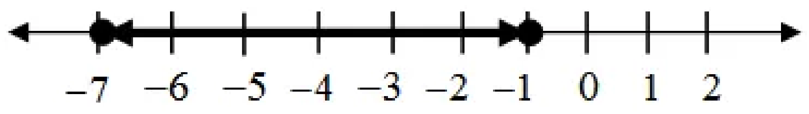
$t+4-4\geq -3-4$

$t\geq -7$

Hence, the solution for second inequality is $t\geq -7$.

Therefore, the solution set is represented as $\boxed{\{t \mid -7\leq t\leq -1\}}$.

Graph the solution as follows:



Answer 48E.

Consider the following inequality:

$|2x+5|<4$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|<n$, then $a<n$ and $a>-n$

In this case the inequality is expressed as

$2x+5<4$ or $2x+5>-4$

First consider the first inequality.

$2x+5<4$

Simplify the inequality by subtracting 5 on both sides.

$2x+5<4$

$2x+5-5<4-5$

$2x<-1$

$x<-\frac{1}{2}$

Hence, the solution for first inequality is $x<-\frac{1}{2}$.

Now consider the second inequality.

$$2x+5>-4$$

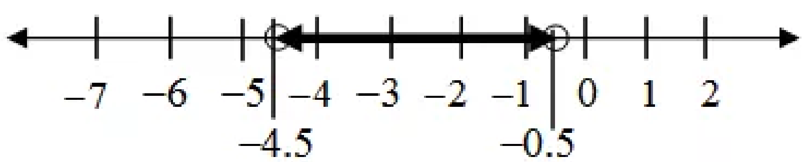
Simplify the inequality by subtracting 10 on both sides.

$$2x+5>-4$$
$$2x+5-5>-4-5$$
$$2x>-9$$
$$x>-\frac{9}{2}$$

Hence, the solution for second inequality is $x>-\frac{9}{2}$.

Therefore, the solution set is represented as $\boxed{\{x\,|\,-4.5<x<-0.5\}}$.

Graph the solution as follows:



Answer 49E.

Consider the following inequality:

$$|3d+4|<8$$

The objective is to solve the inequality and graph the solution set.

The absolute value of any real number is defined as any non negative value regardless of its sign. It can be positive or negative.

If $|a|<n$, then $a<n$ and $a>-n$

In this case the inequality is expressed as

$3d+4<8$ or $3d+4>-8$

First consider the first inequality.

$$3d+4<8$$

Simplify the inequality by subtracting 4 on both sides.

$$3d+4<8$$
$$3d+4-4<8-4$$
$$3d<4 \qquad \frac{4}{3}=1.334$$
$$d<\frac{4}{3}$$

Hence, the solution for first inequality is $d<\frac{4}{3}$.

Now consider the second inequality.

$$3d + 4 > -8$$

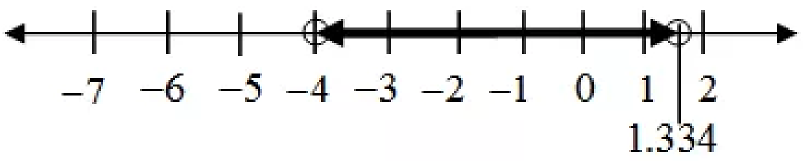
Simplify the inequality by subtracting 4 on both sides.

$$3d + 4 > -8$$
$$3d + 4 - 4 > -8 - 4$$
$$3d > -12$$
$$d > -\frac{12}{3}$$
$$d > -4$$

Hence, the solution for second inequality is $d > -4$.

Therefore, the solution set is represented as $\boxed{\{d \mid -4 < d < \frac{4}{3}\}}$.

Graph the solution as follows:



Answer 50E.

Consider the following inequality:

$$3x + 2y < 9$$

The objective is to find the correct order pairs.

In order to check the solution consider $(1,3)$

Substitute $(1,3)$ in the given inequality

$$3x + 2y < 9$$
$$3 \times 1 + 2 \times 3 < 9 \text{ False}$$
$$9 \not< 9$$

The point $(1,3)$ doesn't satisfy the inequality.

Now consider $(3,2)$

Substitute $(3,2)$ in the given inequality

$$3x+2y<9$$
$$3\times 3+2\times 1<9 \text{ False}$$
$$11 \not< 9$$

The point $(3,2)$ doesn't satisfy the inequality.

Now consider $(-2,7)$

Substitute $(-2,7)$ in the given inequality

$$3x+2y<9$$
$$3\times -2+2\times 7<9$$
$$-6+14<9 \quad \text{True}$$
$$8<9$$

The point $(-2,7)$ satisfies the inequality.

Now consider $(-4,11)$

Substitute $(-4,11)$ in the given inequality

$$3x+2y<9$$
$$3\times -4+2\times 11<9$$
$$-12+22<9 \quad \text{False}$$
$$10 \not< 9$$

The point $(3,2)$ doesn't satisfy the inequality.

Therefore, the order pair that satisfies the inequality is $\boxed{(-2,7)}$.

Answer 51E.

Consider the following inequality:

$$5-y\geq 4x$$

The objective is to find the correct order pairs.

In order to check the solution consider $(2,-5)$

Substitute $(2,-5)$ in the given inequality

$$5-y\geq 4x$$
$$5-(-5)\geq 4\times 2 \text{ True}$$
$$10\geq 8$$

The point $(2,-5)$ satisfies the inequality.

Now consider $\left(\frac{1}{2},7\right)$

Substitute $\left(\frac{1}{2},7\right)$ in the inequality

$$5-y \geq 4x$$

$$5-(-7) \geq 4 \times \frac{1}{2} \text{ True}$$

$$12 \geq 2$$

The point $\left(\frac{1}{2},7\right)$ also satisfies the inequality.

Now consider $(-1,6)$

Substitute $(-1,6)$ in the given inequality

$$5-y \geq 4x$$

$$5-6 \geq 4 \times -1 \text{ False}$$

$$1 \not\geq -4$$

The point $(-1,6)$ doesn't satisfy the inequality.

Now consider $(-3,20)$

Substitute $(-3,20)$ in the inequality

$$5-y \geq 4x$$

$$5-20 \geq 4 \times -3 \text{ False}$$

$$-15 \not\geq -12$$

The point $(-3,20)$ doesn't satisfy the given inequality.

Therefore, the order pairs that satisfy the inequality are $\boxed{(2,-5),\left(\frac{1}{2},7\right)}$.

Answer 52E.

Consider the following inequality:

$$\frac{1}{2}y \leq 6-x$$

The objective is to find the correct order pairs.

In order to check the solution consider $(-4,15)$

Substitute $(-4,15)$ in the given inequality

$$\frac{1}{2}y \leq 6-x$$

$$\frac{1}{2} \times 15 \leq 6-(-4) \text{ True}$$

$$\frac{15}{2} \leq 10$$

The point $(-4,15)$ satisfies the inequality.

Now consider $(5,1)$

Substitute $(5,1)$ in the inequality

$$\frac{1}{2}y \le 6 - x$$

$$\frac{1}{2}\times 1 \le 6 - 5 \text{ True}$$

$$\frac{1}{2} \le 1$$

The point $(5,1)$ also satisfies the inequality.

Now consider $(3,8)$

Substitute $(3,8)$ in the given inequality

$$\frac{1}{2}y \le 6 - x$$

$$\frac{1}{2}\times 8 \le 6 - 3 \text{ False}$$

$$4 \not\le 3$$

The point $(3,8)$ doesn't satisfy the inequality.

Now consider $(-2,25)$

Substitute $(-2,25)$ in the inequality

$$\frac{1}{2}y \le 6 - x$$

$$\frac{1}{2}\times 25 \le 6 - (-2) \text{ False}$$

$$\frac{25}{2} \not\le 8$$

The point $(-2,25)$ doesn't satisfy the given inequality.

Therefore, the order pairs that satisfy the inequality are $\boxed{(-4,15),(5,1)}$.

Answer 53E.

Consider the following inequality:

$-2x < 8 - y$

The objective is to find the correct order pairs.

In order to check the solution consider $(5,10)$

Substitute $(5,10)$ in the given inequality

$-2x < 8 - y$
$-2 \times 5 < 8 - 10$ True
$-10 < -2$

The point $(5,10)$ satisfies the inequality.

Now consider $(3,6)$

Substitute $(3,6)$ in the inequality

$-2x < 8 - y$
$-2 \times 3 < 8 - 6$ True
$-6 < 2$

The point $(3,6)$ also satisfies the inequality.

Now consider $(-4,0)$

Substitute $(-4,0)$ in the given inequality

$-2x < 8 - y$
$-2 \times -4 < 0$ False
$8 \not< 0$

The point $(-4,0)$ doesn't satisfy the inequality.

Now consider $(-3,6)$

Substitute $(-3,6)$ in the inequality

$-2x < 8 - y$
$-2 \times -3 < 8 - 6$ False
$6 \not< 2$

The point $(-3,6)$ doesn't satisfy the given inequality.

Therefore, the order pairs that satisfy the inequality are $\boxed{(5,10),(3,6)}$.

Answer 54E.

The objective is to graph the inequality.

Consider the following inequality:

$$y-2x<-3$$

First step is to change the inequality to an equation.

$$y-2x=-3$$

Express the above equation in slope intercept form $y=mx+c$

$$y-2x=-3$$
$$y-2x=-3$$
$$y=2x-3$$

Start with set of values for *x*, substituting different values of *x* will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x=0$

$$y=2x-3$$
$$y=2\times 0-3$$
$$y=-3$$

Hence, the point is $(0,-3)$.

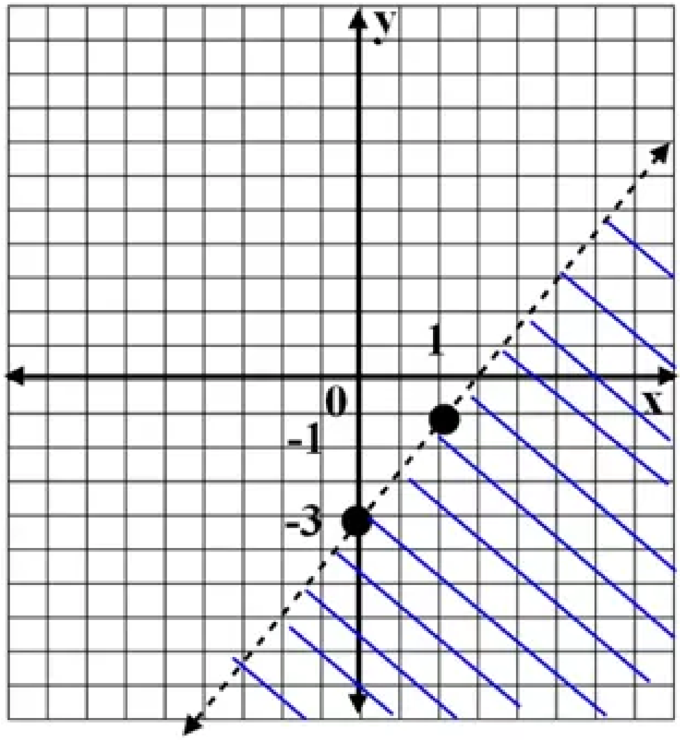
Consider $x=1$

$$y=2x-3$$
$$y=2\times 1-3$$
$$y=-1$$

Hence, the point is $(1,-1)$.

Draw a dotted line passing through the above points. Since $y <$, shade below the line

Hence, $y-2x<-3$ is shown as:



Answer 55E.

The objective is to graph the inequality.

Consider the following inequality:

$x+2y \geq 4$

First step is to change the inequality to an equation.

$x+2y=4$

Express the above equation in slope intercept form $y = mx + c$

$$x + 2y = 4$$
$$2y = -x + 4$$
$$y = -\frac{1}{2}x + \frac{4}{2}$$
$$y = -\frac{1}{2}x + 2$$

Start with set of values for *x*, substituting different values of *x* will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x = 0$

$$y = -\frac{1}{2}x + 2$$
$$y = -\frac{1}{2} \times 0 + 2$$
$$y = 2$$

Hence, the point is $(0,2)$.

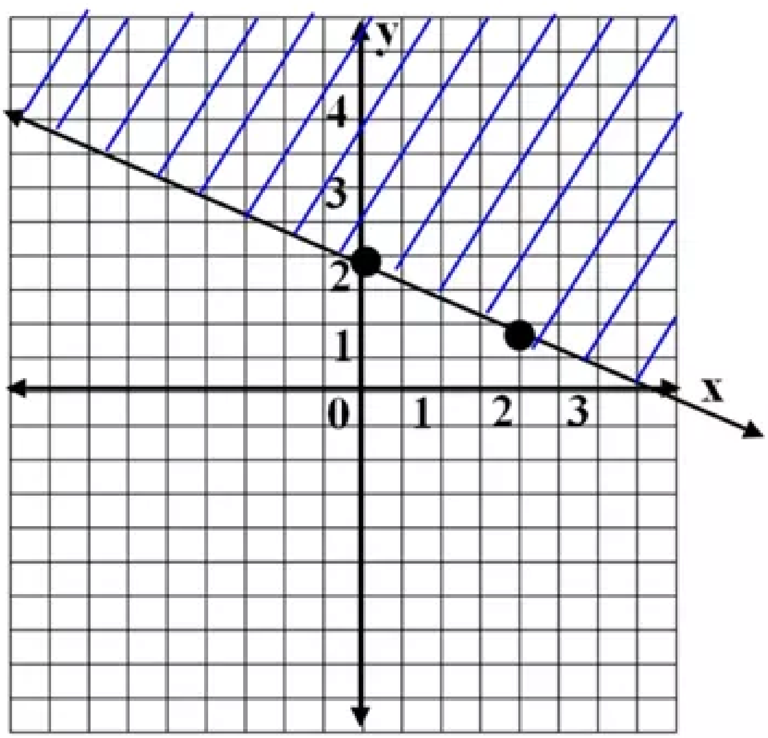
Consider $x = 2$

$$y = -\frac{1}{2}x + 2$$
$$y = -\frac{1}{2} \times 2 + 2$$
$$y = 1$$

Hence, the point is $(2,1)$.

Draw a solid line passing through the above points. Since $y \geq$, shade above the line

Hence, $x + 2y \geq 4$ is shown as:



Answer 56E.

The objective is to graph the inequality.

Consider the following inequality:

$$y \le 5x + 1$$

First step is to change the inequality to an equation.

$$y = 5x + 1$$

Start with set of values for *x*, substituting different values of *x* will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x = 0$

$$y = 5x + 1$$
$$y = 5 \times 0 + 1$$
$$y = 1$$

Hence, the point is $(0,1)$.

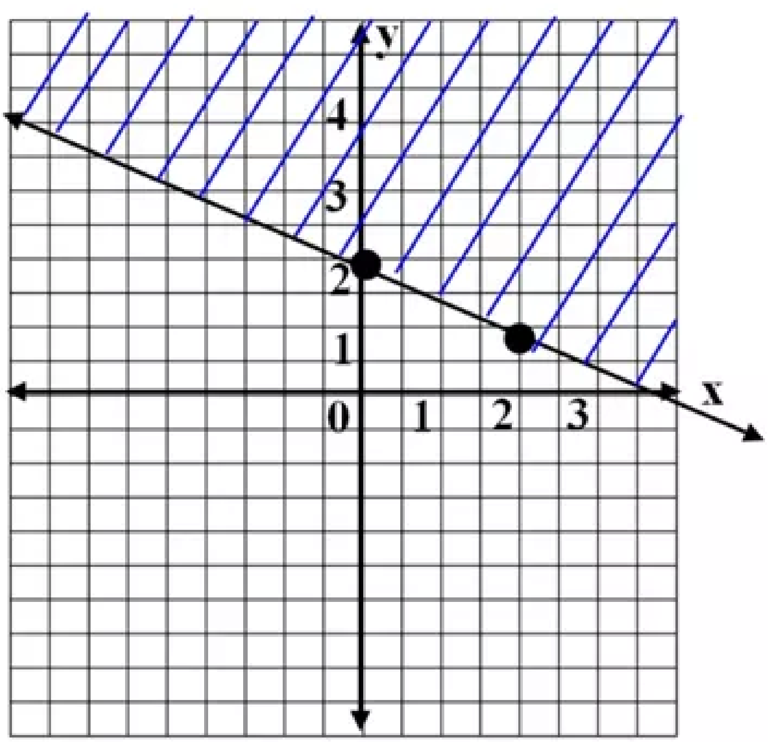
Consider $x = 1$

$$y = 5x + 1$$
$$y = 5 \times 1 + 1$$
$$y = 6$$

Hence, the point is $(1,6)$.

Draw a solid line passing through the above points. Since $y \le$, shade below the line

Hence, $y \le 5x + 1$ is shown as:



Answer 57E.

The objective is to graph the inequality.

Consider the following inequality:

$$2x-3y>6$$

First step is to change the inequality to an equation.

$$2x-3y=6$$

Express the above equation in slope intercept form $y=mx+c$

$$2x-3y=6$$
$$3y=2x-6$$
$$y=\frac{2}{3}x-\frac{6}{3}$$
$$y=\frac{2}{3}x-2$$

Start with set of values for *x*, substituting different values will give pair of points. Joining those pair of point is the equation of the line.

Stat with $x=0$

$$y=\frac{2}{3}x-2$$
$$y=\frac{2}{3}\times 0-2$$
$$y=-2$$

Hence, the point is $(0,-2)$.

Consider $x=3$

$$y=\frac{2}{3}x-2$$
$$y=\frac{2}{3}\times 3-2$$
$$y=0$$

Hence, the point is $(3,0)$.

Draw a dotted line passing through the above points. Since $y <$, shade below the line

Therefore, $y < \frac{2}{3}x - 2$ is shown as: