Chapter 6. Solving Linear Inequalities

Ex. 6.1

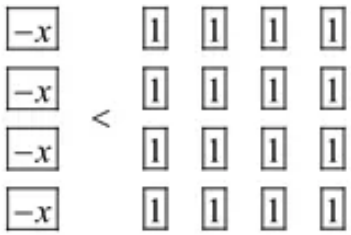
Answer 1AA.

Consider the following inequality:

$-4x < 12$

The objective is to solve the inequality using algebra tiles.

Arrange the given inequality in tile form



In order to simplify the above equation and to solve the negative x, add $4x$ on both sides

$-4x + 4x < 12 + 4x$

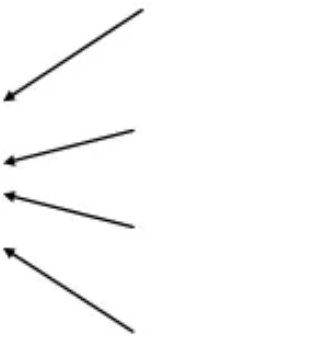
Remove the zero pairs, and then add 12 negative 1 tiles on each side to isolate the x tiles

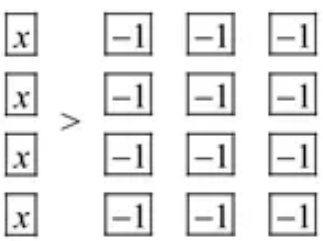
$-12 < 12 + 4x - 12$

$-12 < 4x$

Remove the zero pairs and separate the tiles into four groups

$x > -3$





Separate the tiles into 4 groups

Therefore the solution set represents $\{x \mid x > -3\}$.

Answer 1CU.

Consider the following inequality:

$y < -3$

The objective is to find three similar inequalities.

If we add any numbers to the inequality on both sides the resultant inequality can also be true.

The inequalities can be expressed as

$y + 5 < -3 + 5$

$y + 5 < 2$

Add -2 on both sides of inequality

$y - 2 < -3 - 2$

$y - 2 < -5$

Add 4 on both sides of given inequality.

$y + 4 < -3 + 4$

$y + 4 < 1$

Therefore, the three inequalities that are equivalent to the given inequality can be

$$\boxed{\begin{array}{l} y + 5 < 2 \\ y - 2 < -5 \\ y + 4 < 1 \end{array}}.$$

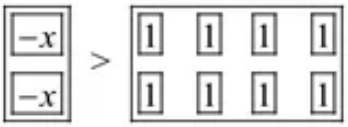
Answer 2AA.

Consider the following inequality:

$-2x > 8$

The objective is to solve the inequality using algebra tiles.

Arrange the given inequality in tile form



In order to simplify the above equation and to solve the negative x, add $2x$ on both sides

$-2x + 2x > 8 + 2x$

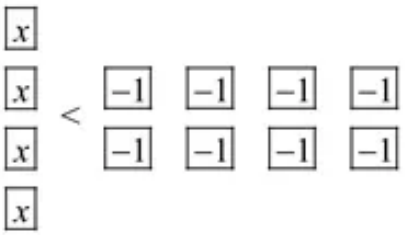
Remove the zero pairs, and then add 8 negative 1 tiles on each side to isolate the x tiles

$-8 > 8 + 2x - 8$

$-8 > 2x$

Remove the zero pairs and separate the tiles into two groups

$x < -4$



Separate the tiles into 2 groups

Therefore the solution set represents $\{x \mid x < -4\}$.

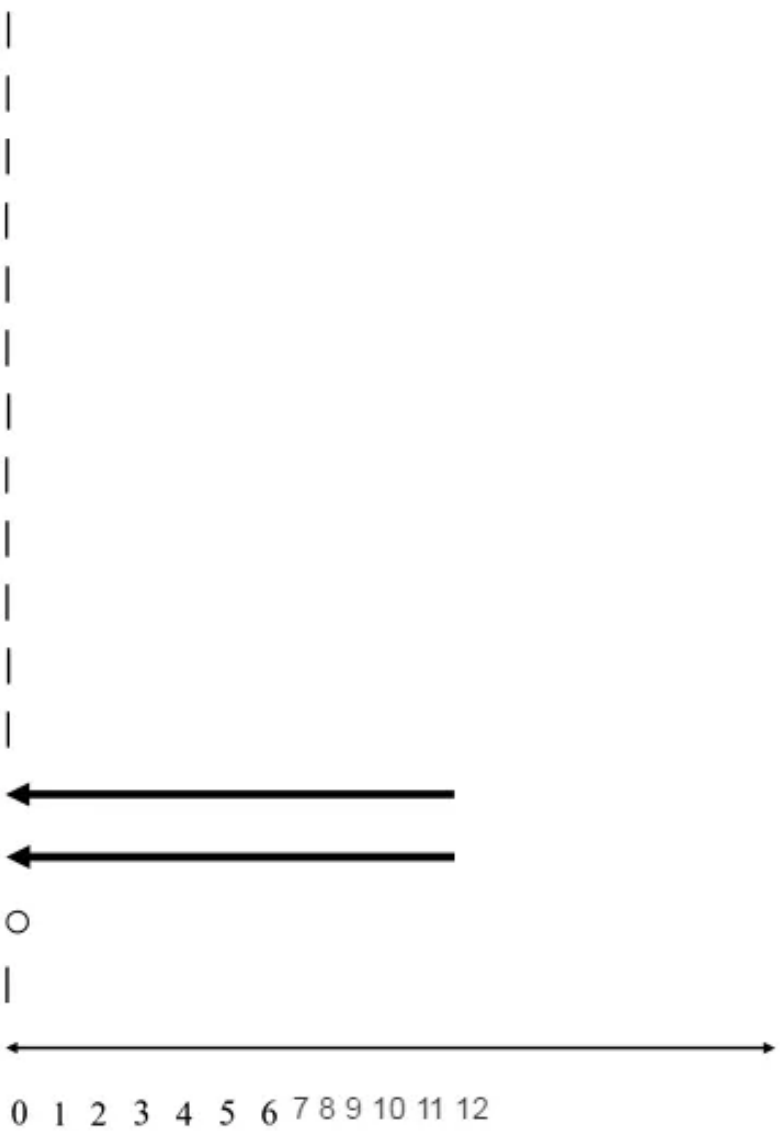
Answer 2CU.

Consider the following inequalities:

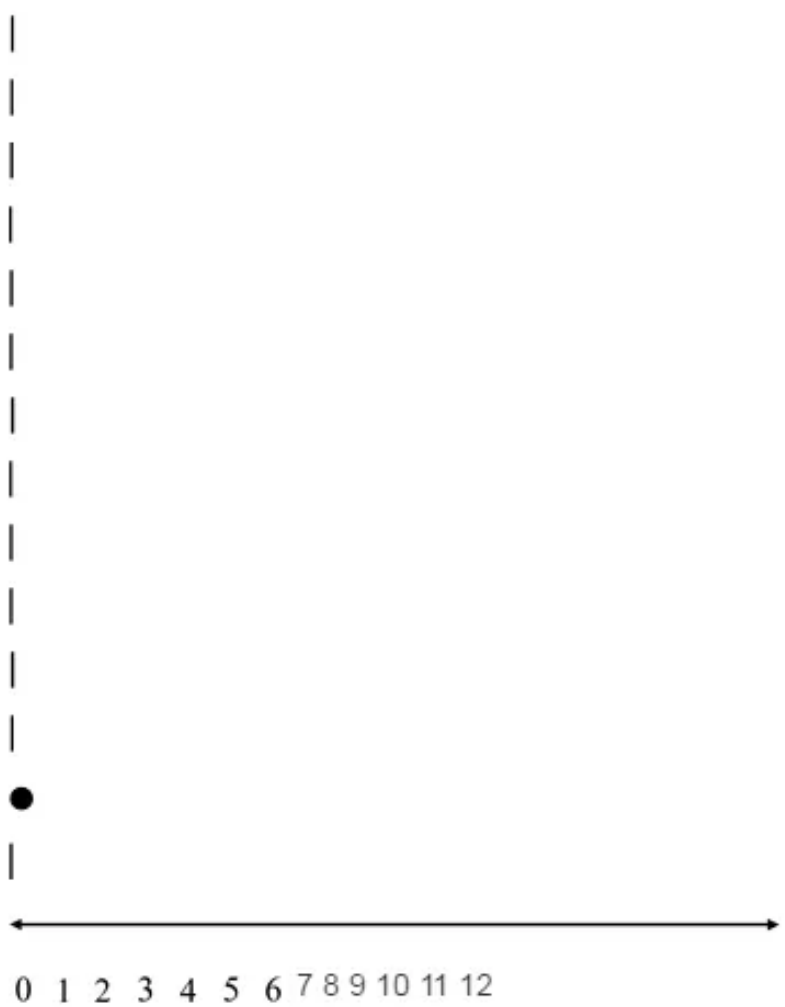
$a < 4$ And $a \leq 4$

The objective is to graph the two given inequalities.

The first inequality show 4 is not included in the inequality. This can be shown in graph as below



The second inequality show 4 is included in the inequality. This can be shown in graph as below



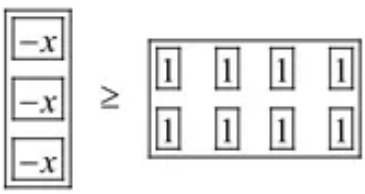
Answer 3AA.

Consider the following inequality:

$-3x \geq -6$

The objective is to solve the inequality using algebra tiles.

Arrange the given inequality in tile form



In order to simplify the above equation and to solve the negative x, add $3x$ on both sides

$-3x + 3x \geq -6 + 3x$

Remove the zero pairs, and then add 6 positive 1 tiles on each side to isolate the x tiles

$6 \geq -6 + 3x + 6$

$6 \geq 3x$

$3x \leq 6$

Remove the zero pairs and separate the tiles into two groups

$x \le 2$

Separate the tiles into 2 groups

Therefore the solution set represents $\{x \mid x \le 2\}$.

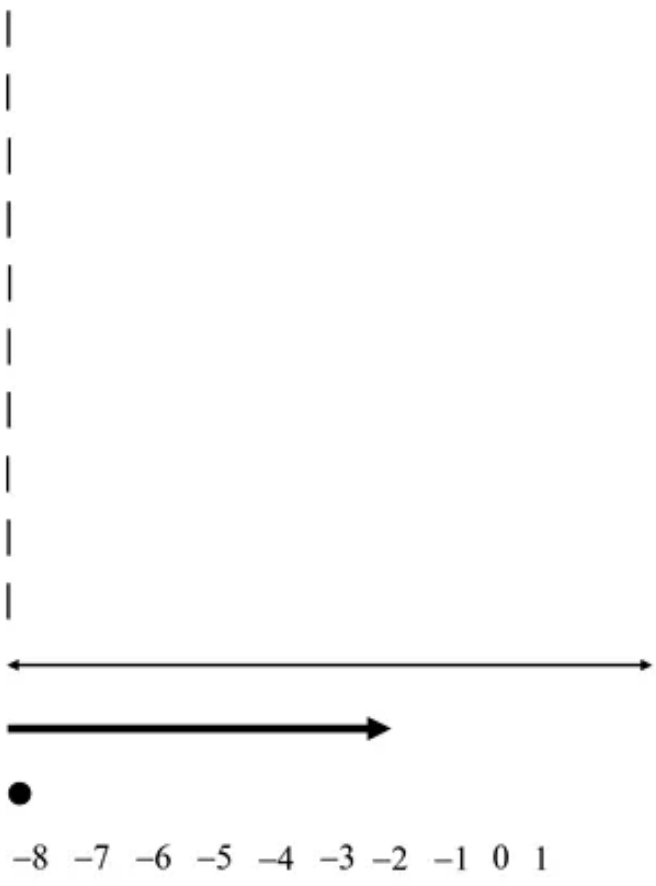
Answer 3CU.

Consider the following inequality:

$\{b \mid b \ge -5\}$

The objective is to explain the given expression.

The given expression can be represented on the number line as below



This can be read as all numbers b such that b is greater than or equal to -5.

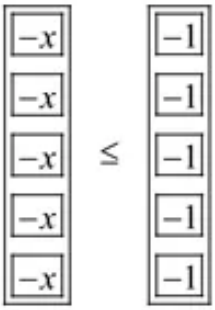
Answer 4AA.

Consider the following inequality:

$-5x \le -5$

The objective is to solve the inequality using algebra tiles.

Arrange the given inequality in tile form



In order to simplify the above equation and to solve the negative x, add $5x$ on both sides

$-5x + 5x \le -5 + 5x$

Remove the zero pairs, and then add 5 positive 1 tiles on each side to isolate the x tiles

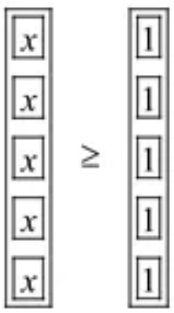
$5 \le -5 + 5x + 5$

$5 \le 5x$

$5x \ge 5$

Remove the zero pairs and separate the tiles into five groups

$x \ge 1$



Separate the tiles into 5 groups

Therefore the solution set represents $\{x \mid x \ge 1\}$.

Answer 4CU.

Consider the following inequality:

$m + 3 > 7$

The objective is to the graphical representation of the given expression.

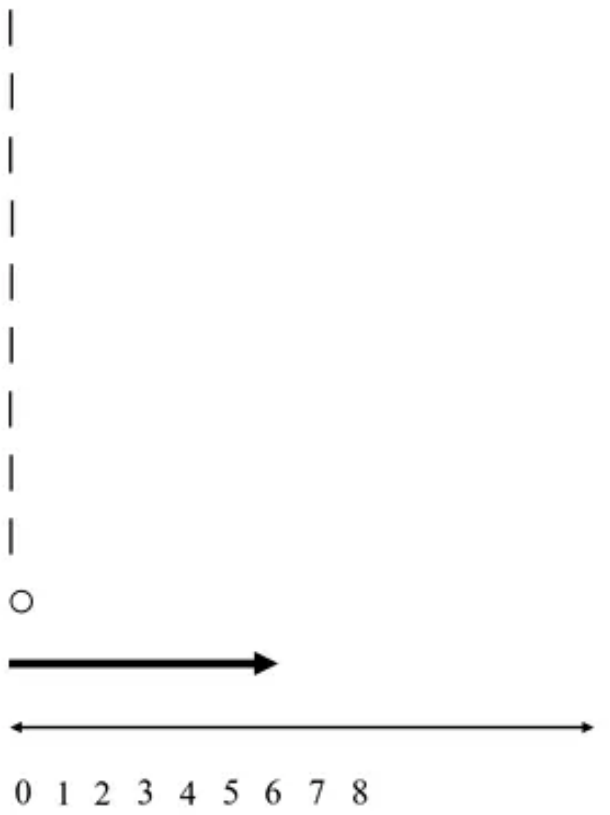
Simply the given expression

Add -3 to each side

$m + 3 - 3 > 7 - 3$

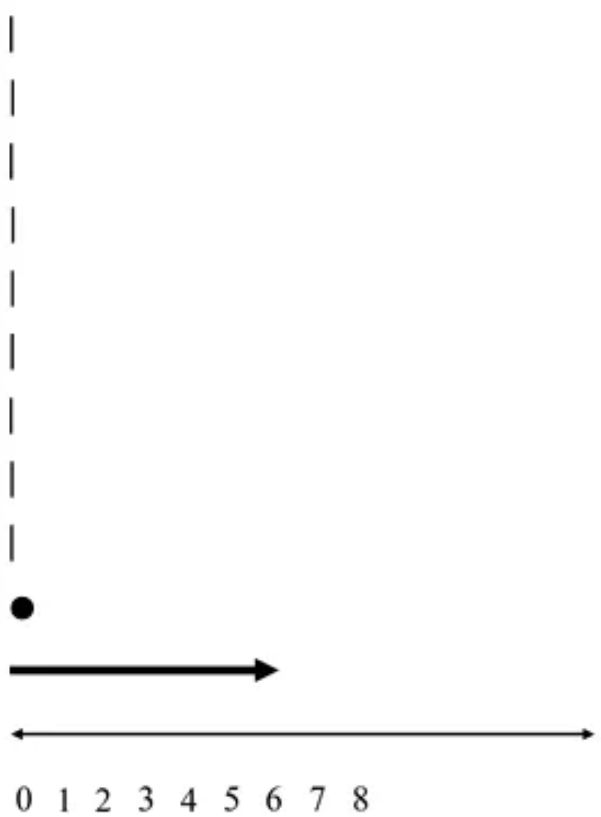
$m > 4$

Which give us the value of m is always greater than 4.



The graph above shows that that 4 is not included and arrow mark pointing towards right tell that it is greater than 4.

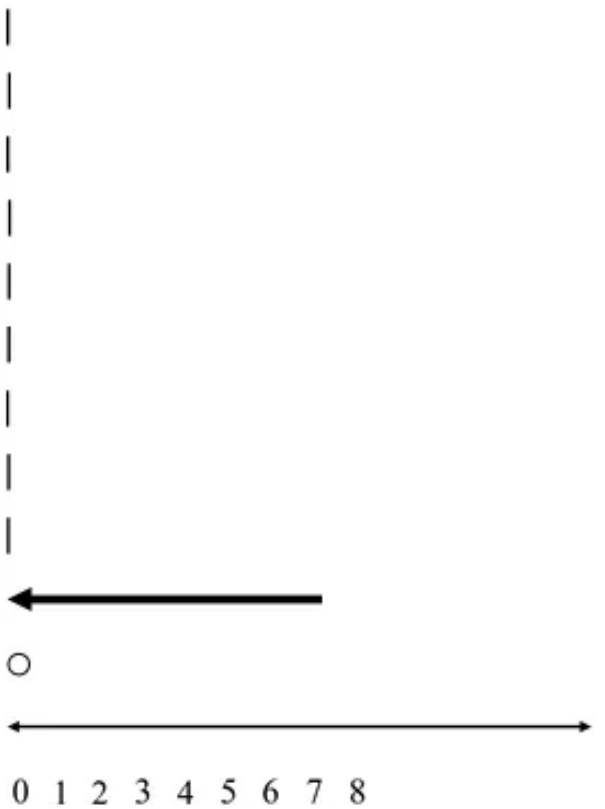
This satisfies the given inequality $m > 4$.



The graph above shows that 4 is included in the inequality and arrow mark pointing towards right tell that it is greater than 4.

Which can be stated as the vale is equal and greater than 4.

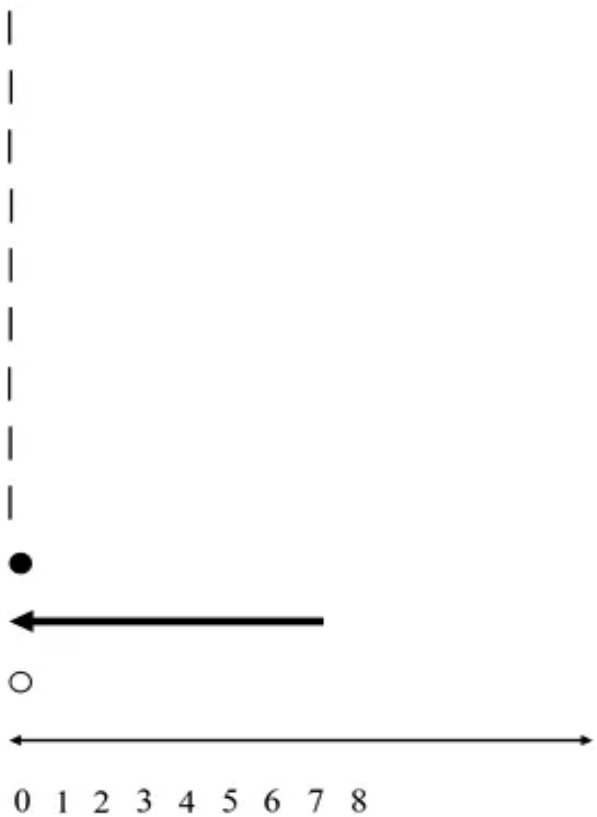
This graph doesn't satisfy the inequality $m > 4$.



The graph above shows that 4 is not included in the inequality and arrow mark pointing towards left tell that it is lesser than 4.

Which can be stated as the value is lesser than 4.

This graph doesn't satisfy the inequality $m > 4$.



The graph above shows that 4 is included in the inequality and arrow mark pointing towards left tell that it is lesser than 4.

Which can be stated as the value is lesser than or equal to 4.

This graph doesn't satisfy the inequality $m > 4$.

Therefore the solution of the given inequality is $\boxed{a}$.

Answer 5AA.

Consider the following inequality:

$-4x+12<5$

The objective is to find the coefficient of x

The coefficient of x of is -4 from the above inequality.

Therefore the coefficient of x is negative.

Answer 5CU.

Consider the following inequality:

$a+4<2$

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

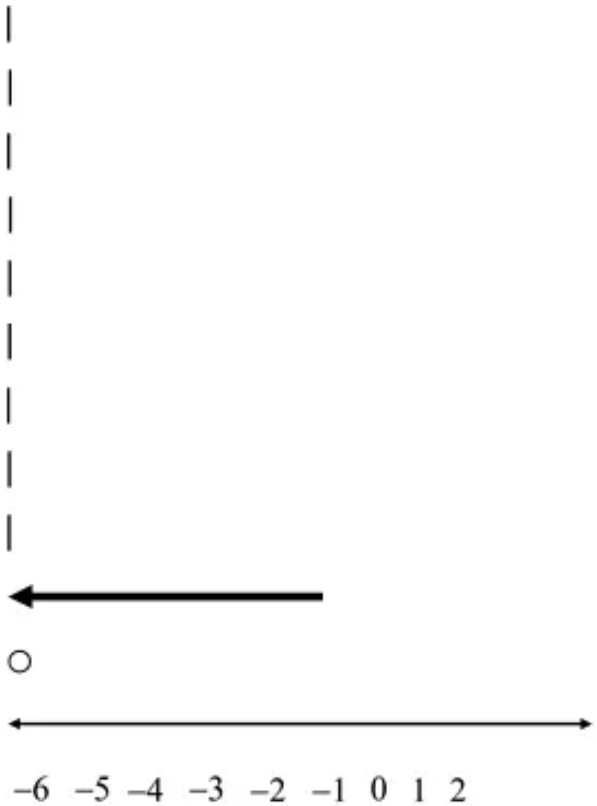
Simply the given expression

Add -4 to each side

$a+4-4<2-4$

$a<-2$

The solution set represents $\{a \mid a<-2\}$



The graph above shows that -2 is not included and arrow mark pointing towards left tell that it is less than -2.

Answer 6AA.

Consider the following inequality:

$-4x < 12$

The objective is to find the inequality symbol and location of variables.

The given inequality is expressed as negative 4x is less than 12.

The above inequality can also be written as

$4x > -12$

This states that when the solution is expressed, so that variables remain on the same side but with a negative symbol, the inequality symbol can be reversed in the final solution.

Answer 6CU.

Consider the following inequality:

$9 \le b + 4$

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

Simply the given expression

Add -4 to each side

$9 - 4 \le b + 4 - 4$

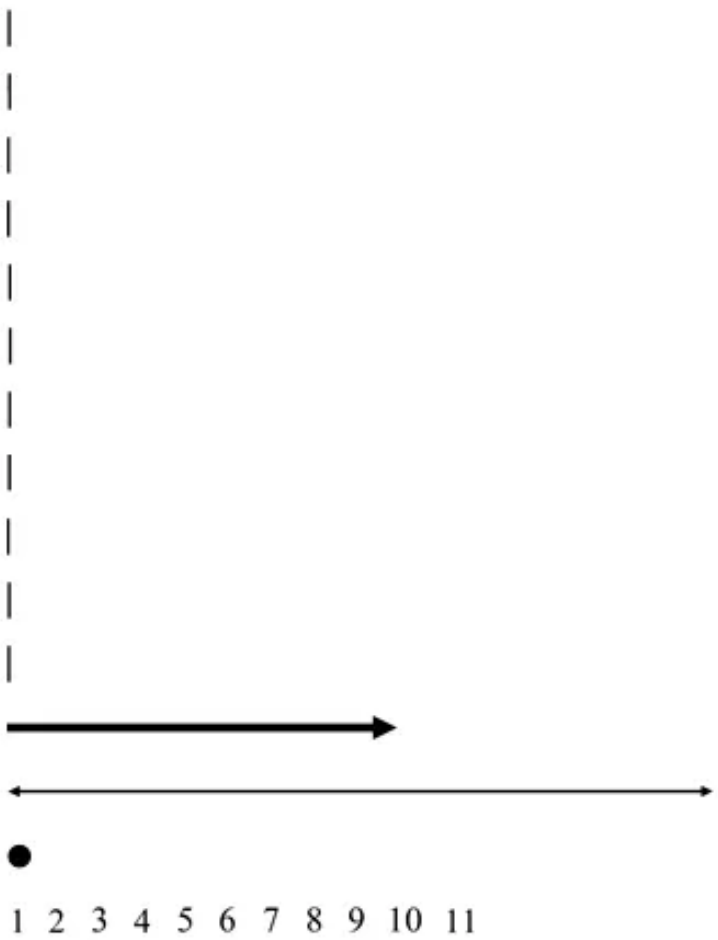
$5 \le b$

This can be represented as

$b \ge 5$

The solution set represents $\{b \mid b \ge 5\}$

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



Answer 7AA.

Consider the following inequality:

$2x \geq 6$

The objective is to find the solution for the inequality.

Simplify the expression by dividing both sides by 2.

$2x \geq 6$

$\frac{2x}{2} \geq \frac{6}{2}$

$x \geq 3$

The solution set represents $\boxed{\{x \mid x \geq 3\}}$.

Now consider

$$-2x \geq 6$$

Simplify the expression by dividing both sides by- 2, and changes the inequality symbol

$$-\frac{2x}{2} \leq -\frac{6}{2}$$
$$x \leq -3$$

In this case the inequality symbol is reversed.

The solution set represents $\boxed{\{x \mid x \leq -3\}}$.

Answer 7CU.

Consider the following inequality:

$$t - 7 \geq 5$$

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

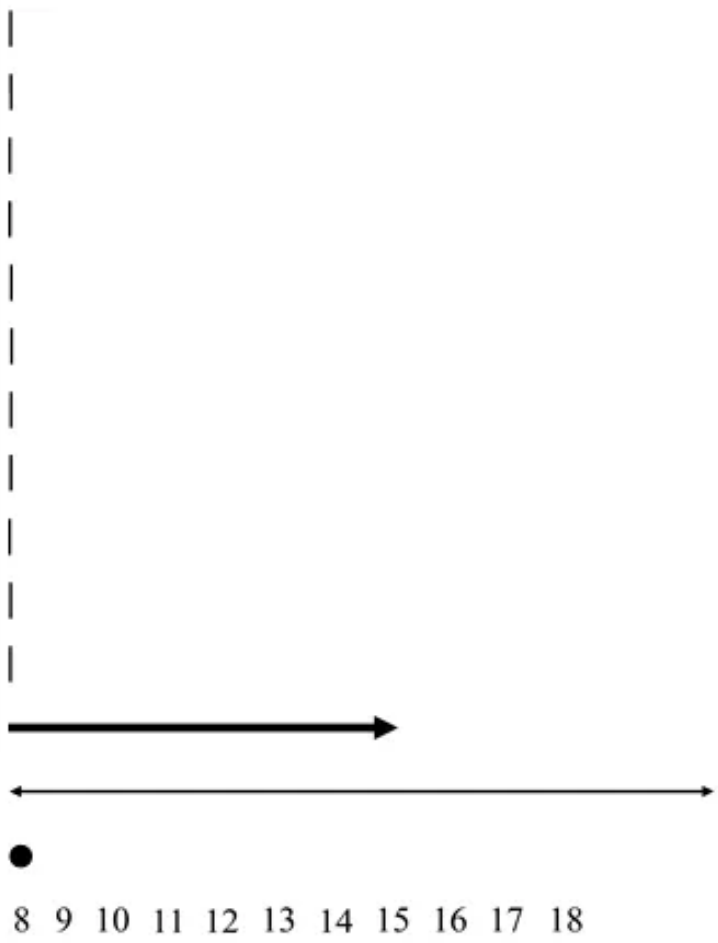
Simply the given expression

Add +7 to each side

$$t - 7 \geq 5$$
$$t - 7 + 7 \geq 5 + 7$$
$$t \geq 12$$

The solution set represents $\{t \mid t \geq 12\}$

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



Answer 8CU.

Consider the following inequality:

$$y-2.5>3.1$$

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

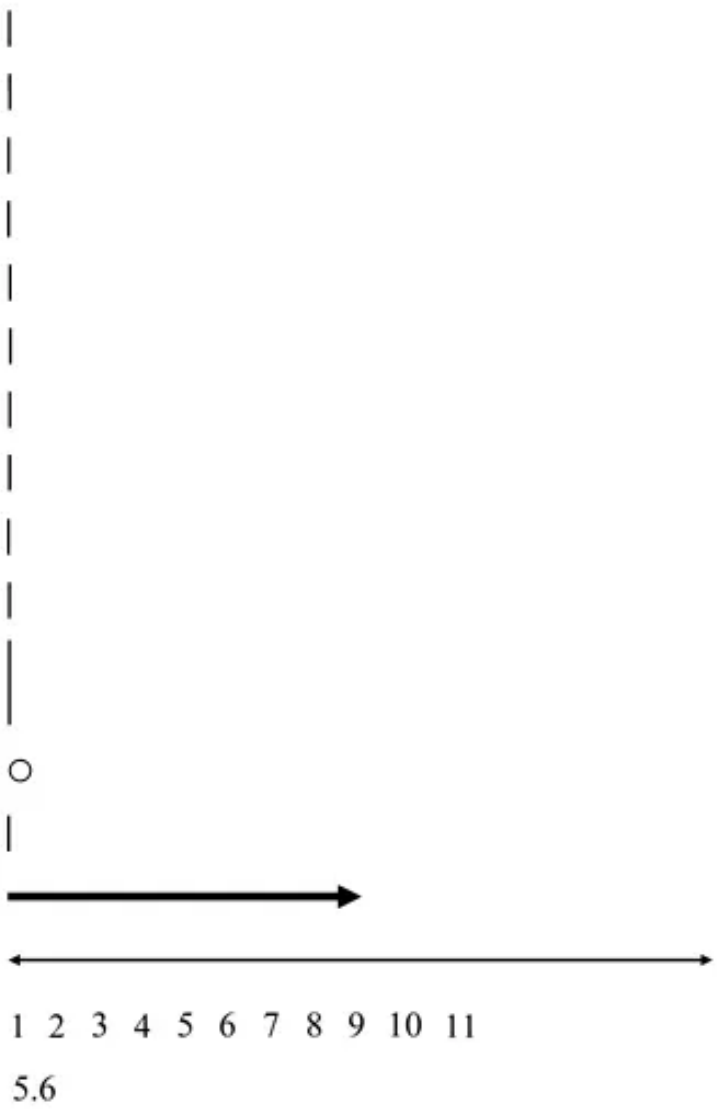
Simply the given expression

Add +2.5 to each side

$$y-2.5>3.1$$
$$y-2.5+2.5>3.1+2.5$$
$$y>5.6$$

The solution set represents $\{y \mid y>5.6\}$

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number 5.6.



Answer 9CU.

Consider the following inequality:

$5.2r + 6.7 \geq 6.2r$

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

Simply the given expression

Subtract 5.2r on both sides

$5.2r + 6.7 \geq 6.2r$

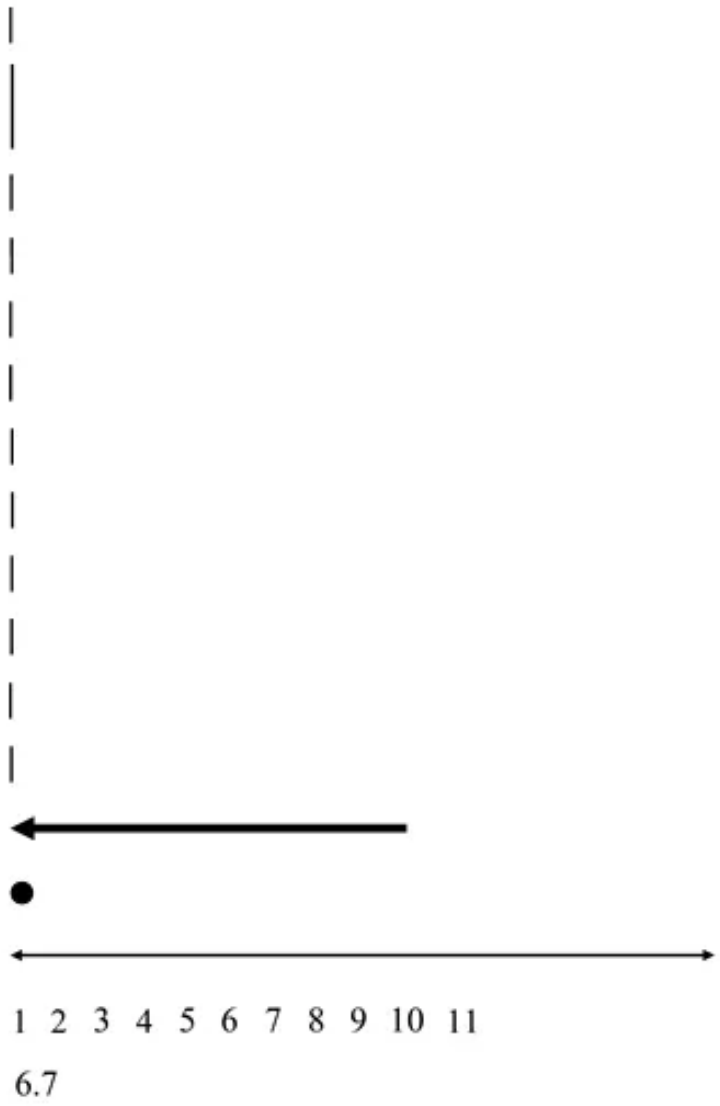
$5.2r + 6.7 - 5.2r \geq 6.2r - 5.2r$

$6.7 \geq r$

$r \leq 6.7$

The solution set represents $\{r \mid r \leq 6.7\}$

The inequality can be represented in the graph with the dotted circle and heavy arrow mark left to the number 6.7.



Answer 10CU.

Consider the following inequality:

$$7p \le 6p - 2$$

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

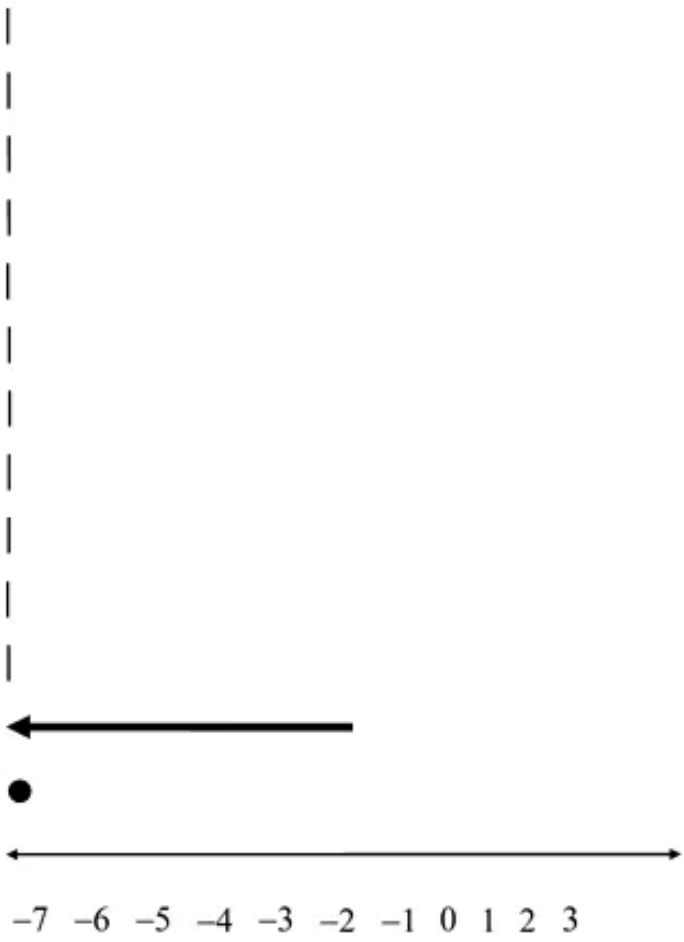
Simply the given expression

Subtract 6p on both sides

$$7p \le 6p - 2$$
$$7p - 6p \le 6p - 6p - 2$$
$$p \le -2$$

The solution set represents $\{p \mid p \le -2\}$

The inequality can be represented in the graph with the dotted circle and heavy arrow mark left to the number -2.



Answer 11CU.

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

Consider the number as n and decreased by 8 which means negative of 8. At most means less than equal to 14.

This can be expressed as following inequality

$$n-8\le 14$$

Simply the given expression

Add 8 on both sides

$$n-8\le 14$$
$$n-8+8\le 14+8$$
$$n\le 22$$

The number is less than or equal to 22.

The solution set represents $\{n\,|\,n\le 22\}$.

Answer 12CU.

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

Consider the number as n, add it by 7 and greater than 2.

This can be expressed as following inequality

$$n+7>2$$

Simply the given expression

Subtract 7 on both sides

$$n+7>2$$
$$n+7-7>2-7$$
$$n>-5$$

The number is greater than -5.

The solution set represents $\{n \mid n>-5\}$.

Answer 13CU.

The objective is to find how many grams of fat Chapa have during the rest of the day.

Consider 'r' as the number of grams left during the rest of the day.

The total limit of fat intake per day is not more than 60 grams. 3*2 grams of fat for breakfast and 21 grams of fat for lunch were consumed in the day.

This can be expressed as following inequality

$$6+21+r \le 60$$

Simply the given expression

$$27+r \le 60$$

Subtract 27 on both sides

$$27+r \le 60$$
$$27+r-27 \le 60-27$$
$$r \le 33$$

The solution set represents $\{r \mid r \le 33\}$.

Therefore the number of grams of fat left during the rest of the day is $\boxed{r \le 33}$.

Answer 14PA.

$x-3\geq -2$

The objective is to solve the inequality and match with the corresponding graph.

Simply the given expression

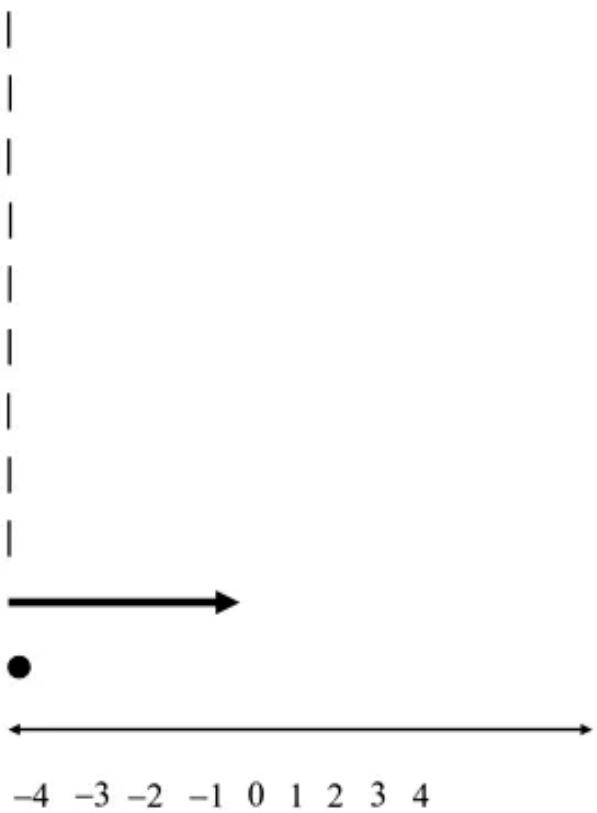
Add 3 on both sides

$x-3\geq -2$

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

$x\geq 1$

This inequality tells that x is greater than or equal to 1 which matches with the graph shown in d.



Therefore the given expression matches with $\boxed{d}$.

Answer 15PA.

$x+7\le 6$

The objective is to solve the inequality and match with the corresponding graph.

Simply the given expression

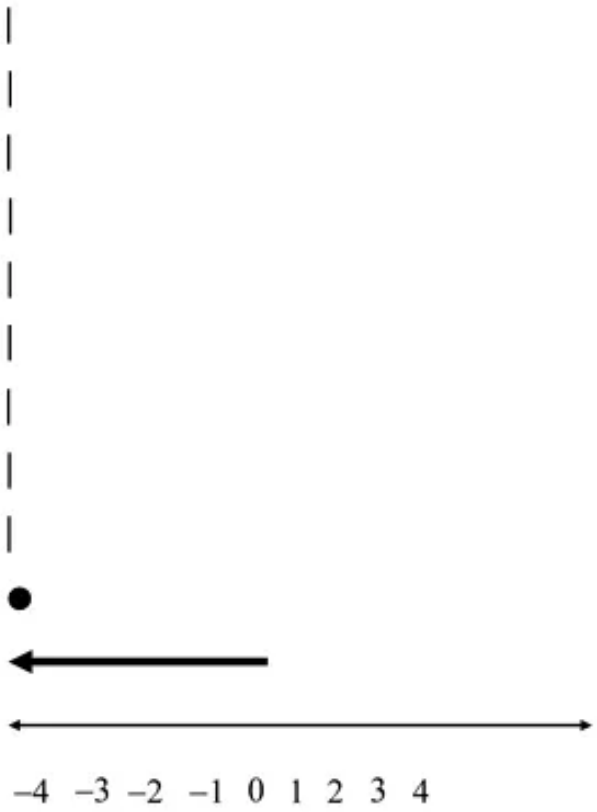
Subtract 7 on both sides

$x+7\le 6$

$x+7-7\le 6-7$

$x\le -1$

This inequality tells that x is less than or equal to -1 which matches with the graph shown in f.



Therefore the given expression matches with $\boxed{f}$.

Answer 16PA.

$4x > 3x - 1$

The objective is to solve the inequality and match with the corresponding graph.

Simply the given expression

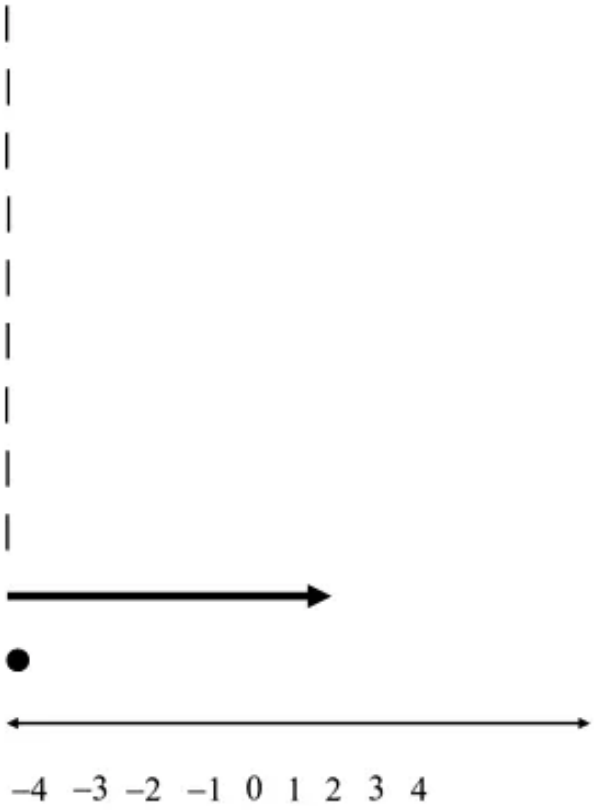
Subtract $3x$ on both sides

$4x > 3x - 1$

$4x - 3x > 3x - 1 - 3x$

$x > -1$

This inequality tells that x is greater than -1 which matches with the graph shown in a.



Therefore the given expression matches with $\boxed{a}$.

Answer 17PA.

$8+x<9$

The objective is to solve the inequality and match with the corresponding graph.

Simply the given expression

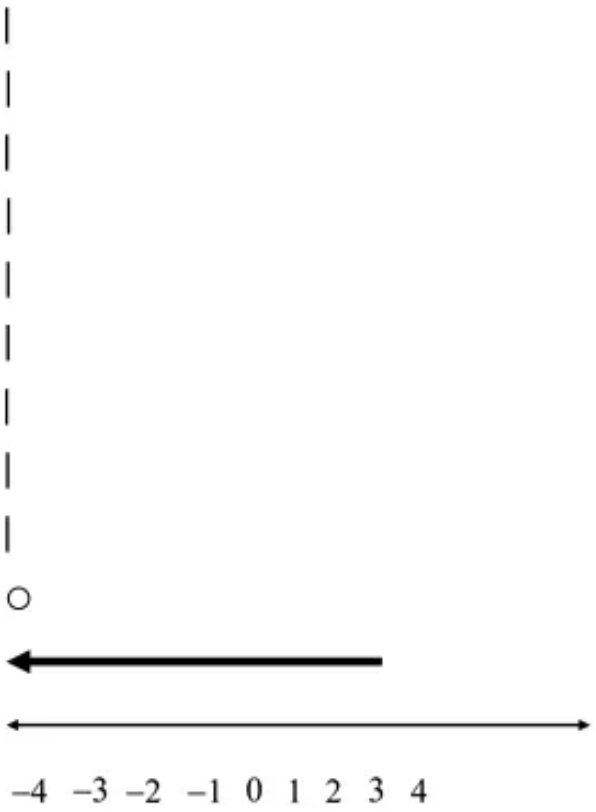
Subtract 8 on both sides

$8+x<9$

$8+x-8<9-8$

$x<1$

This inequality tells that x is less than 1 which matches with the graph shown in c.



Therefore the given expression matches with $\boxed{c}$.

Answer 18PA.

$5 \le x+6$

The objective is to solve the inequality and match with the corresponding graph.

Simply the given expression

Subtract 6 on both sides

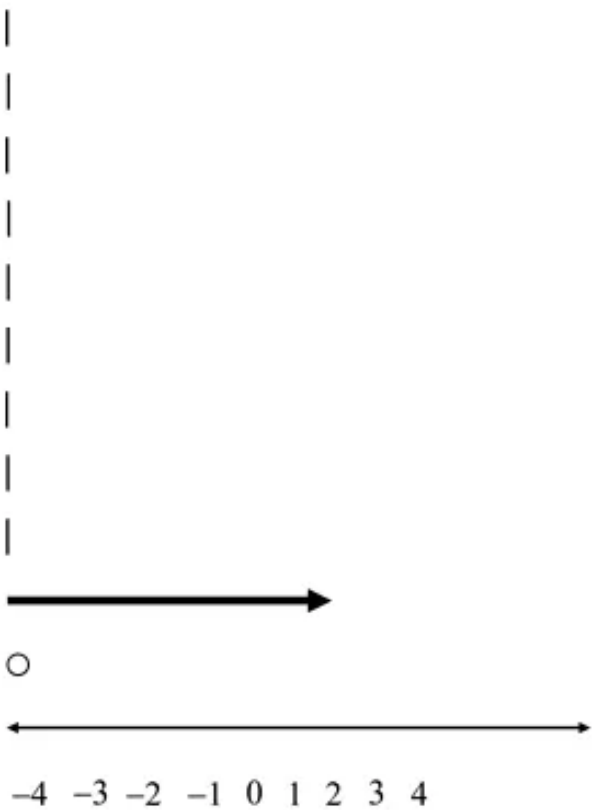
$5 \le x+6$

$5-6 \le x+6-6$

$-1 \le x$

$x \ge -1$

This inequality tells that x is greater than and equal to-1 which matches with the graph shown in e.



Therefore the given expression matches with $\boxed{e}$.

Answer 19PA.

$x-1>0$

The objective is to solve the inequality and match with the corresponding graph.

Simply the given expression

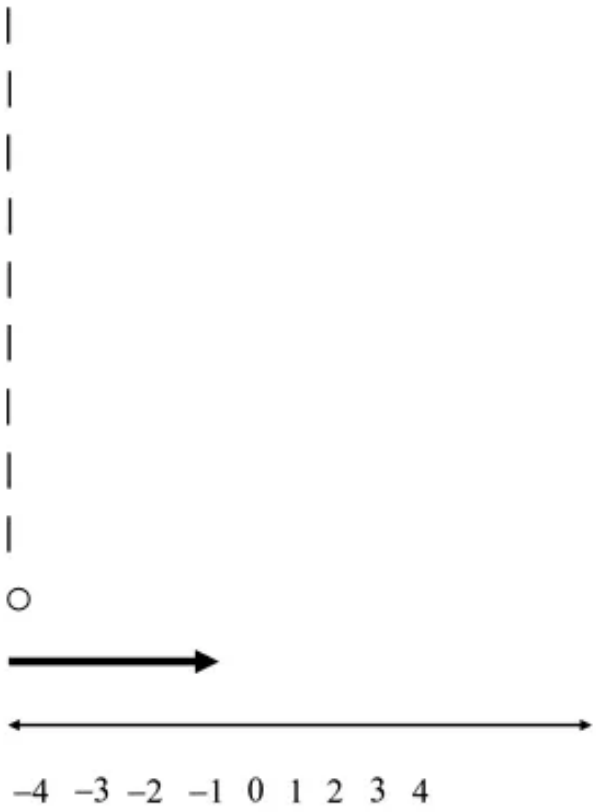
Add 1 on both sides

$x-1>0$

$x-1+1>1$

$x>1$

This inequality tells that x is greater than 1 which matches with the graph shown in b.



Therefore the given expression matches with $\boxed{b}$.

Answer 20PA.

Consider the following inequality:

$t+14\geq 18$

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

Simply the given expression

Subtract 14 on both sides

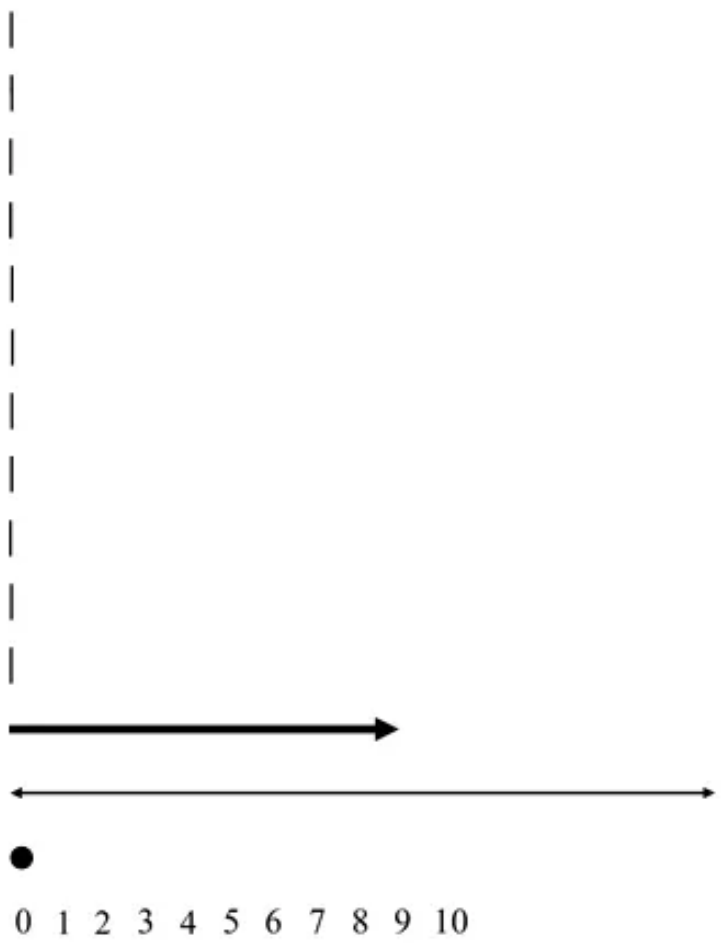
$t+14\geq 18$

$t+14-14\geq 18-14$

$t\geq 4$

Therefore the solution set is represented as $\boxed{\{t\,|\,t\geq 4\}}$

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



Answer 21PA.

Consider the following inequality:

$d+5\le 7$

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

Simply the given expression

Subtract 5 on both sides

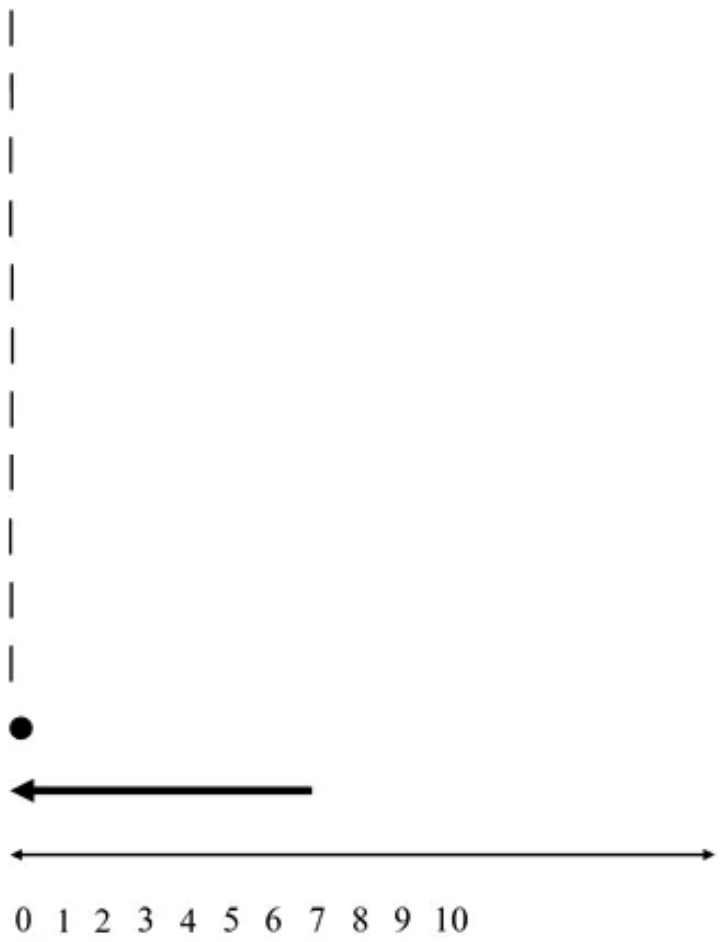
$d+5\le 7$

$d+5-5\le 7-5$

$d\le 2$

Therefore the solution set is represented as $\boxed{\{d\,|\,d\le 2\}}$

The inequality can be represented in the graph with the doted circle and heavy arrow mark left to the number 2.



Answer 22PA.

Consider the following inequality:

$n-7<-3$

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

Simply the given expression

Add 7 on both sides

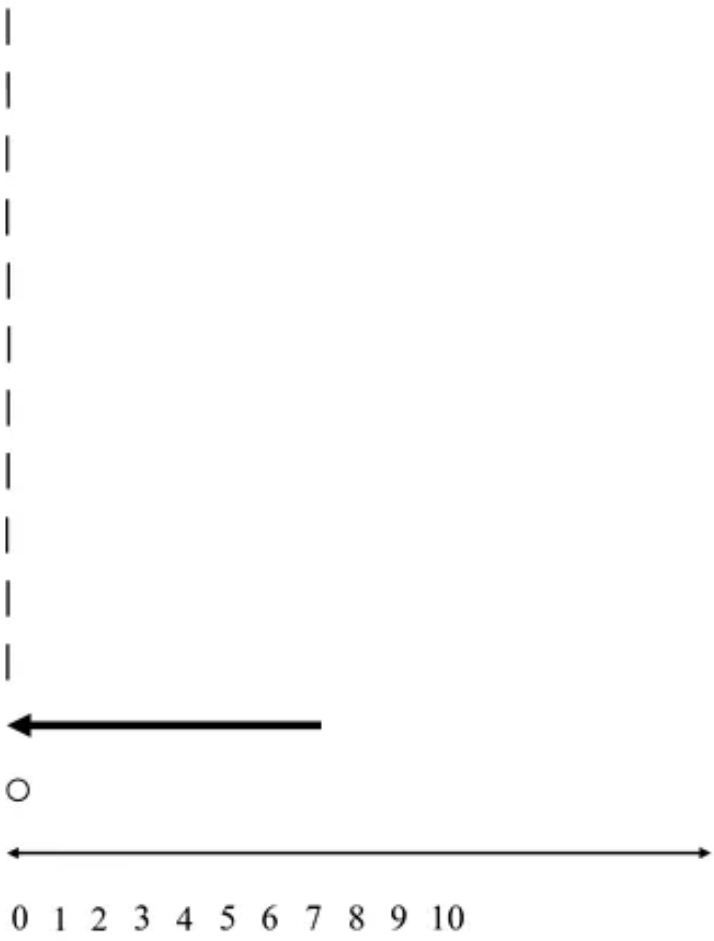
$n-7<-3$

$n-7+7<-3+7$

$n<4$

Therefore the solution set is represented as $\boxed{\{n \mid n<4\}}$

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



Answer 23PA.

Consider the following inequality:

$s-5>-1$

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

Simply the given expression

Add 5 on both sides

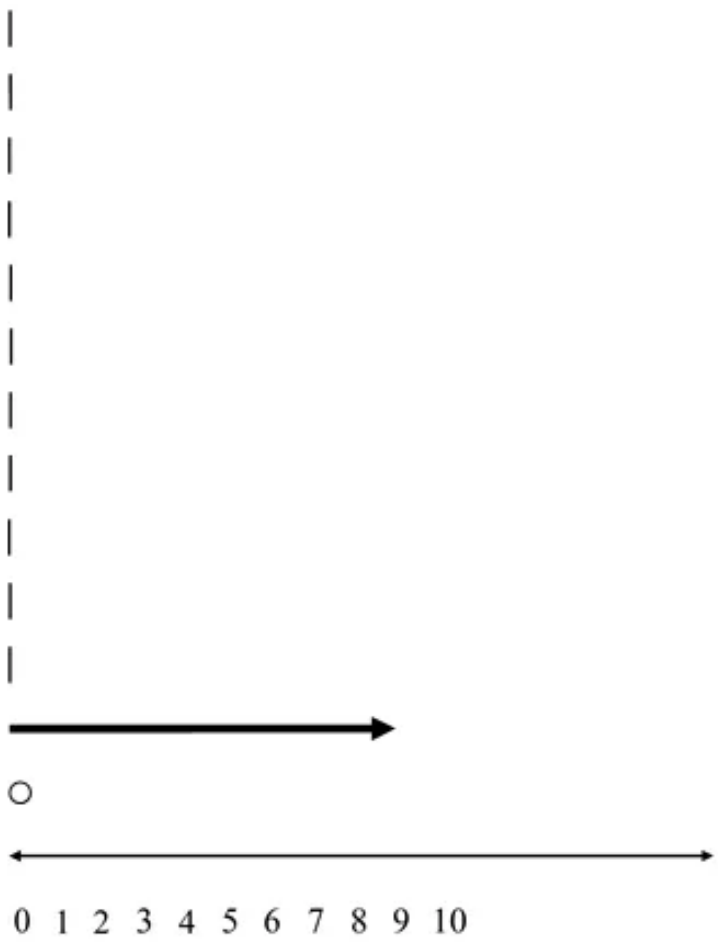
$s-5>-1$

$s-5+5>-1+5$

$s>4$

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

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



Answer 24PA.

Consider the following inequality:

$5 < 3 + g$

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

Simply the given expression

Subtract 3 on both sides

$5 < 3 + g$

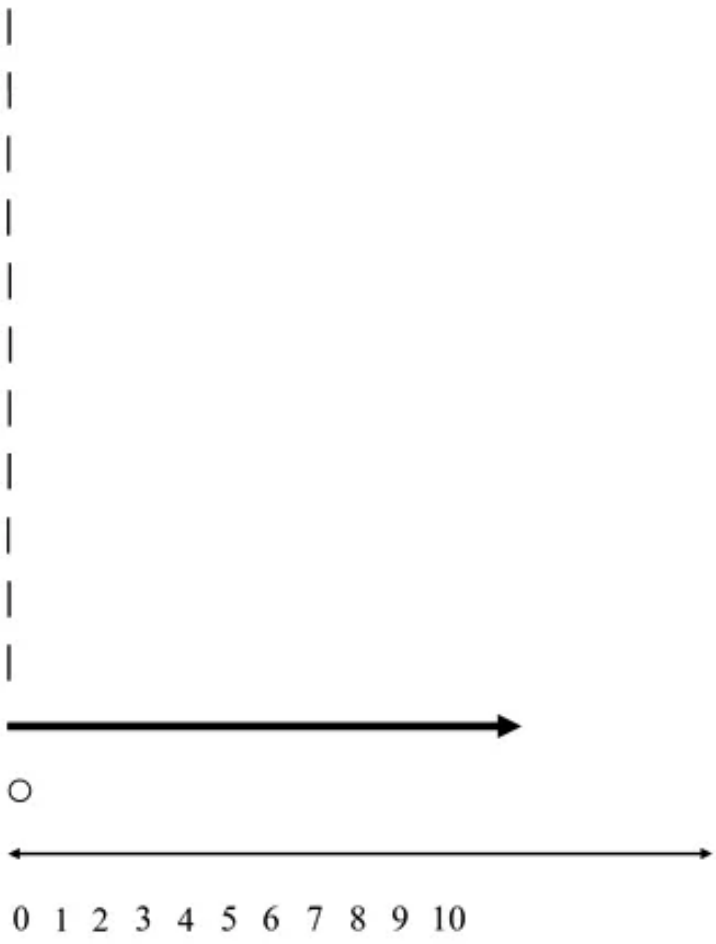
$5 - 3 < 3 + g - 3$

$2 < g$

$g > 2$

Therefore the solution set is represented as $\boxed{\{g \mid g > 2\}}$

The inequality can be represented in the graph with the doted circle and heavy arrow mark right to the number 2.



Answer 25PA.

Consider the following inequality:

$4 > 8 + r$

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

Simply the given expression

Subtract 8 on both sides

$4 > 8 + r$

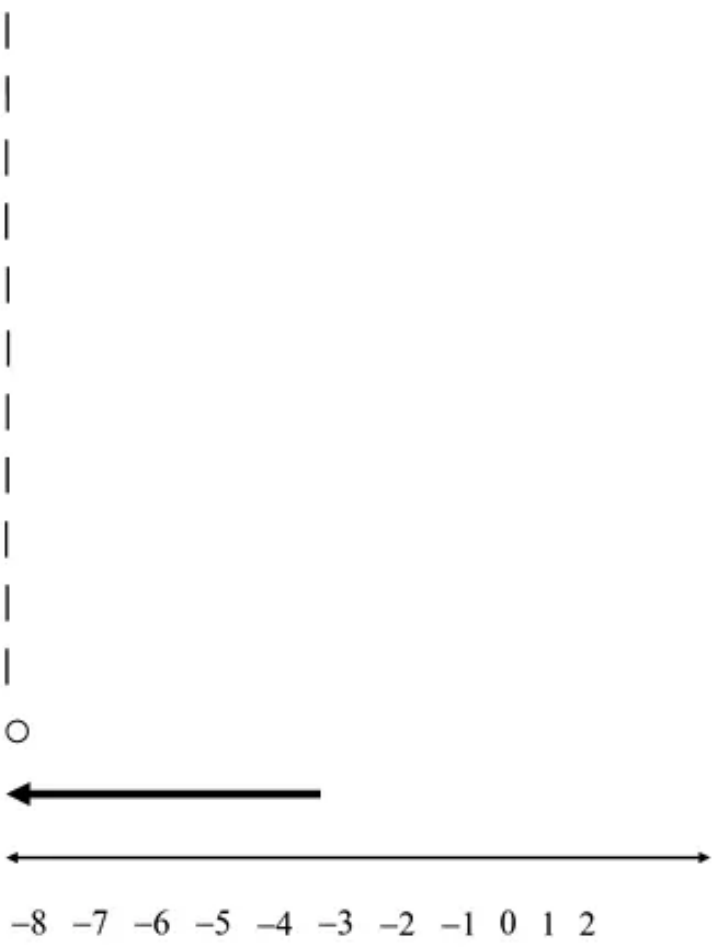
$4 - 8 > 8 + r - 8$

$-4 > r$

$r < -4$

Therefore the solution set is represented as $\boxed{\{r \mid r < -4\}}$

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



Answer 26PA.

Consider the following inequality:

$-3 \geq q - 7$

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

Simply the given expression

Add 7 on both sides

$-3 \geq q - 7$

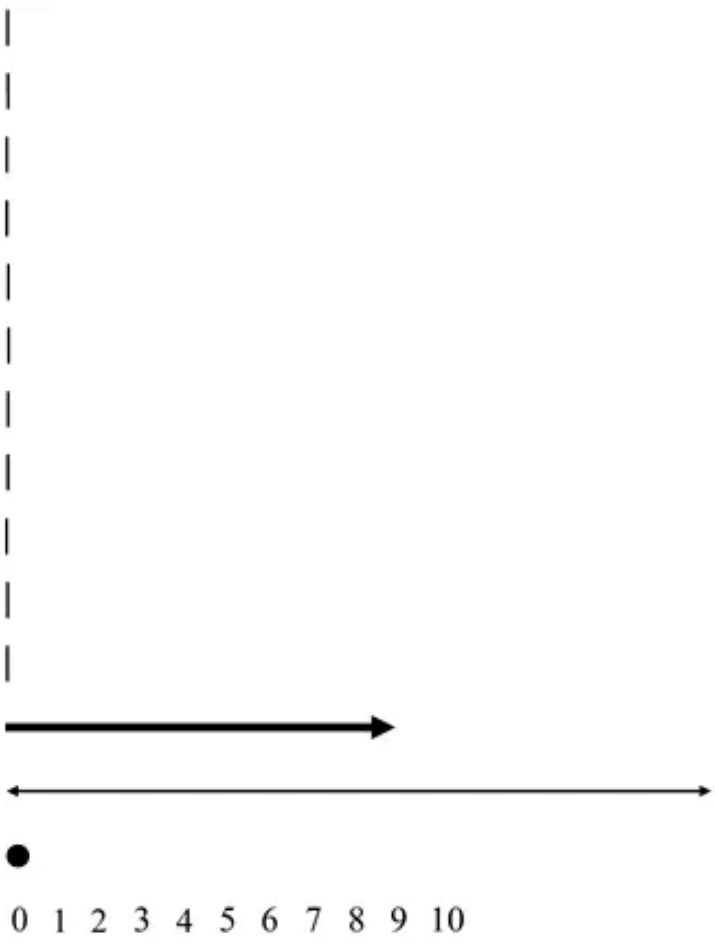
$-3 + 7 \geq q - 7 + 7$

$4 \geq q$

$q \geq 4$

Therefore the solution set is represented as $\boxed{\{q \mid q \geq 4\}}$

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



Answer 27PA.

Consider the following inequality:

$2 \le m-1$

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

Simply the given expression

Add 1 on both sides

$2 \le m-1$

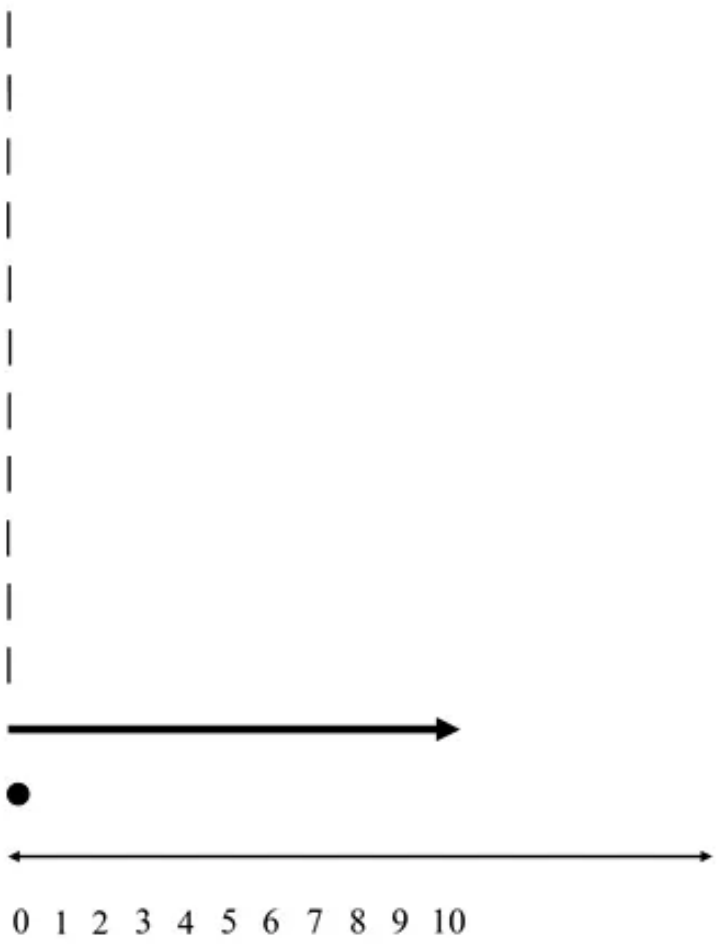
$2+1 \le m-1+1$

$3 \le m$

$m \ge 3$

Therefore the solution set is represented as $\boxed{\{m \mid m \ge 3\}}$

The inequality can be represented in the graph with the doted circle and heavy arrow mark right to the number 3.



Answer 28PA.

Consider the following inequality:

$2y > -8 + y$

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

Simply the given expression

Subtract y on both sides

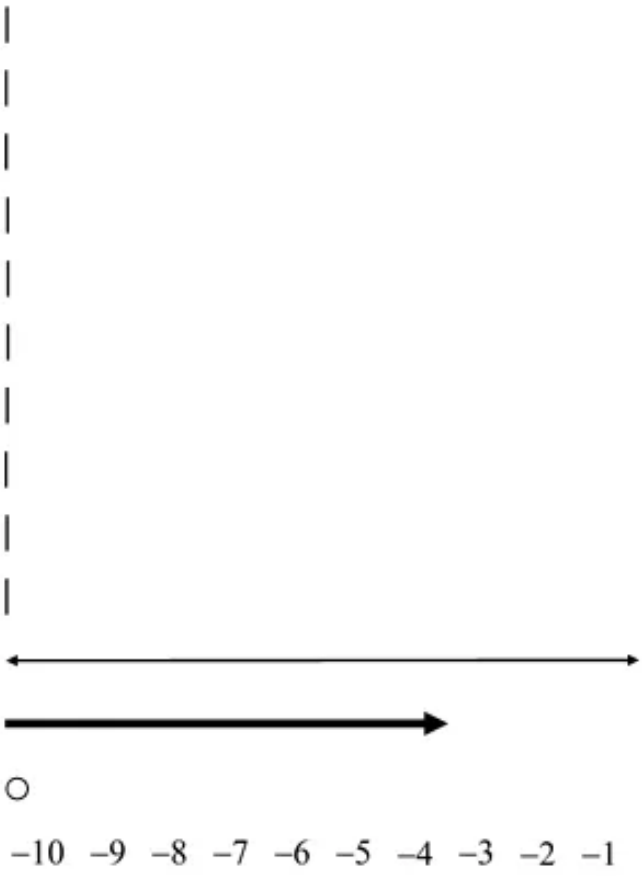
$2y > -8 + y$

$2y - y > -8 + y - y$

$y > -8$

Therefore the solution set is represented as $\boxed{\{y \mid y > -8\}}$

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number -8.



Answer 29PA.

Consider the following inequality:

$3f < -3 + 2f$

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

Simply the given expression

Subtract 2f on both sides

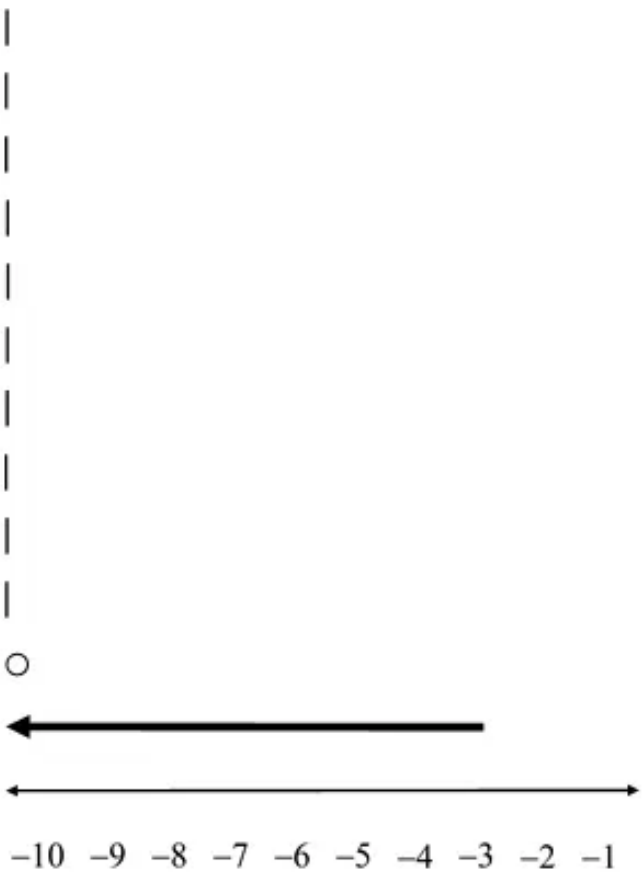
$3f < -3 + 2f$

$3f - 2f < -3 + 2f - 2f$

$f < -3$

Therefore the solution set is represented as $\boxed{\{f \mid f < -3\}}$

The inequality can be represented in the graph with the open circle and heavy arrow mark left to the number -3.



Answer 30PA.

Consider the following inequality:

$3b \le 2b - 5$

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

Simply the given expression

Subtract 2b on both sides

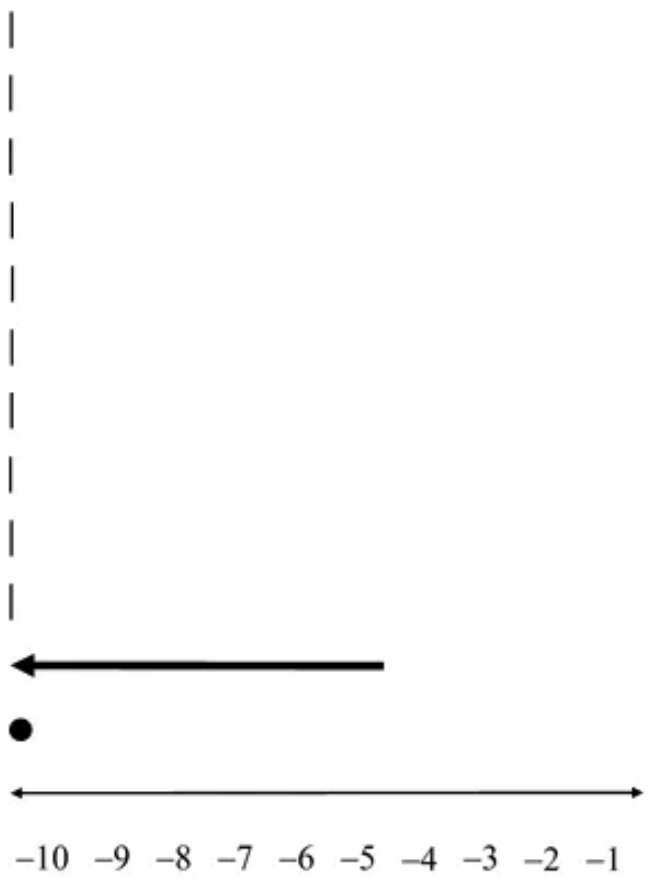
$3b \le 2b - 5$

$3b - 2b \le 2b - 5 - 2b$

$b \le -5$

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

The inequality can be represented in the graph with the dotted circle and heavy arrow mark left to the number -5.



Answer 31PA.

Consider the following inequality:

$4w \geq 3w+1$

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

Simply the given expression

Subtract 3w on both sides

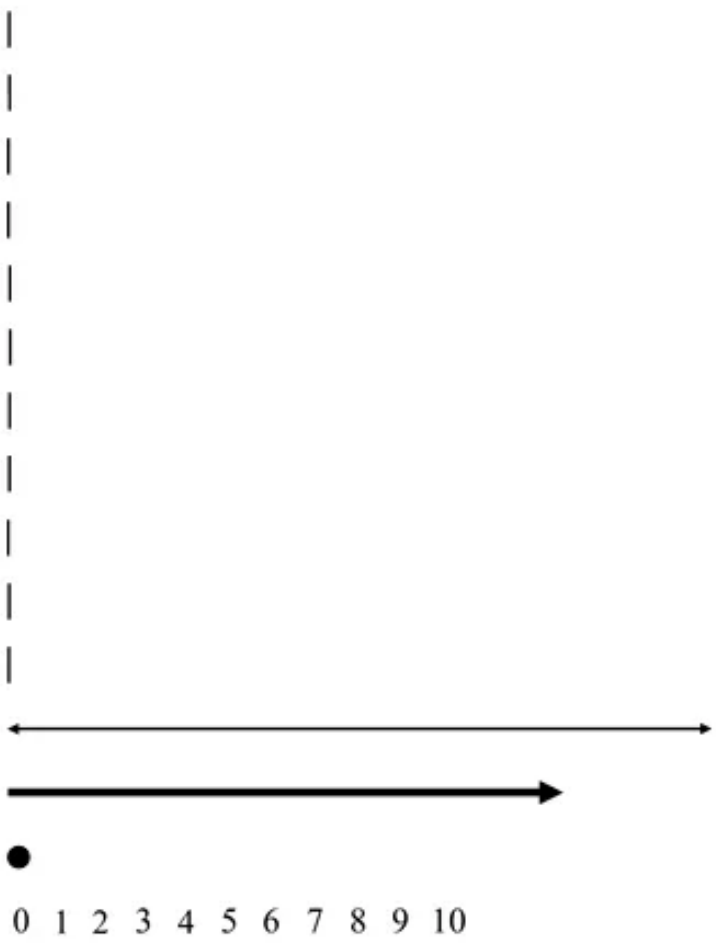
$4w \geq 3w+1$

$4w-3w \geq 3w+1-3w$

$w \geq 1$

Therefore the solution set is represented as $\boxed{\{w \mid w \geq 1\}}$

The inequality can be represented in the graph with the doted circle and heavy arrow mark right to the number 1.



Answer 32PA.

Consider the following inequality:

$$v-(-4)>3$$

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

Simply the given expression

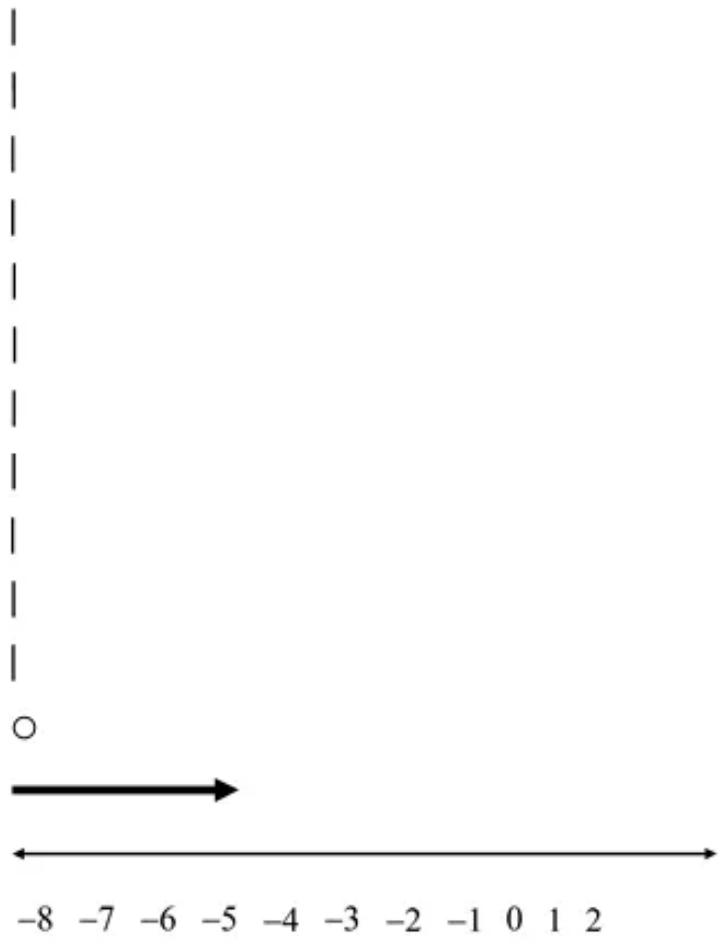
$$v+4>3$$

Subtract 4 on both sides

$$v+4>3$$
$$v+4-4>3-4$$
$$v>-1$$

Therefore the solution set is represented as $\boxed{\{v \mid v>-1\}}$

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



Answer 33PA.

Consider the following inequality:

$$a-(-2)\le -3$$

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

Simply the given expression

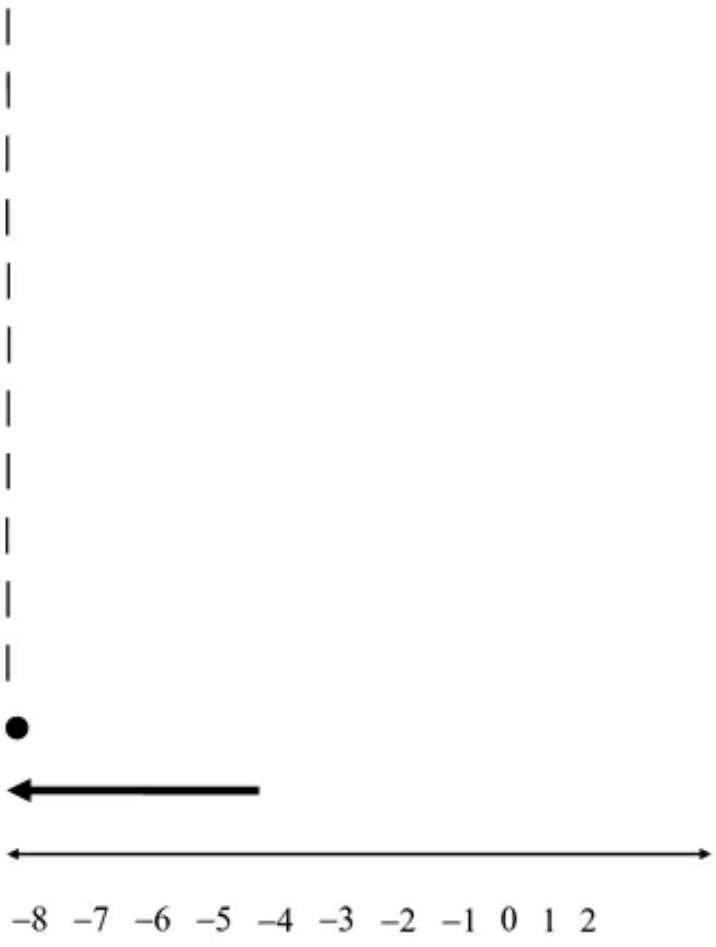
$$a+2\le -3$$

Subtract 2 on both sides

$$a+2\le -3$$
$$a+2-2\le -3-2$$
$$a\le -5$$

Therefore the solution set is represented as $\boxed{\{a\,|\,a\le -5\}}$

The inequality can be represented in the graph with the dotted circle and heavy arrow mark left to the number -5.



Answer 34PA.

Consider the following inequality:

$-0.23 < h - (-0.13)$

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

Simply the given expression

$-0.23 < h + 0.13$

Subtract 0.13 on both sides

$-0.23 < h + 0.13$

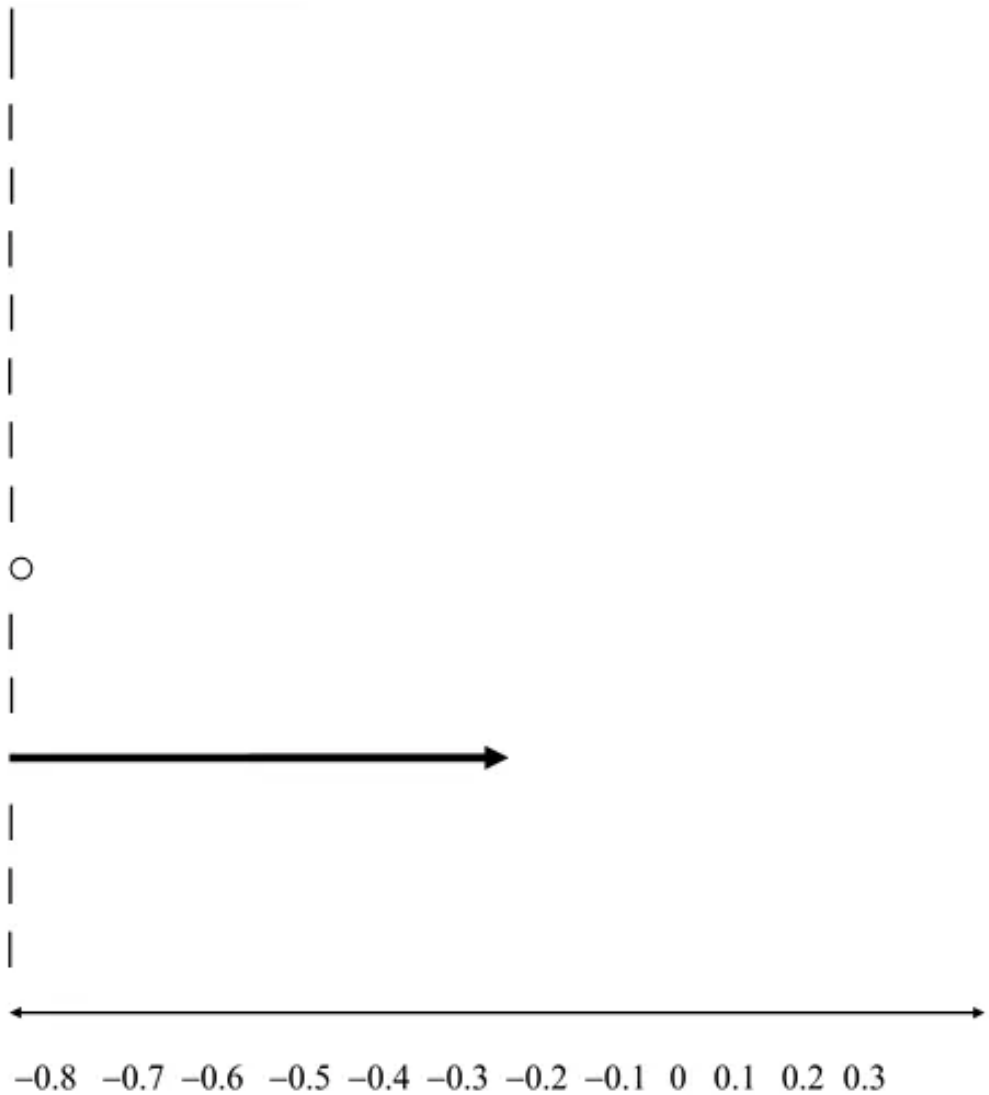
$-0.23 - 0.13 < h + 0.13 - 0.13$

$-0.33 < h$

$h > -0.33$

Therefore the solution set is represented as $\boxed{\{h \mid h > -0.33\}}$

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number -0.33. -0.33



Answer 35PA.

Consider the following inequality:

$$x+1.7\geq 2.3$$

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

Simply the given expression

Subtract 1.7 on both sides

$$x+1.7\geq 2.3$$
$$x+1.7-1.7\geq 2.3-1.7$$
$$x\geq 0.6$$

Therefore the solution set is represented as $\boxed{\{x\,|\,x\geq 0.6\}}$

Answer 36PA.

Consider the following inequality:

$$a+\frac{1}{4}>\frac{1}{8}$$

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

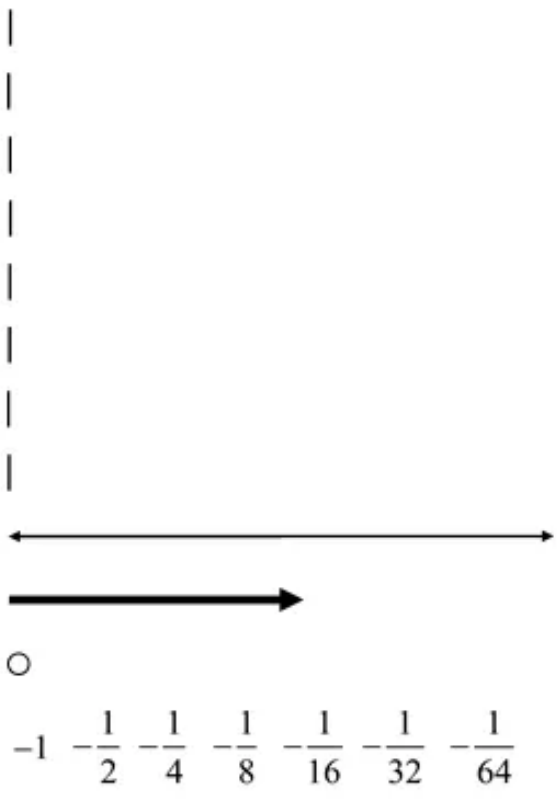
Simply the given expression

Subtract $\frac{1}{4}$ on both sides

$$a+\frac{1}{4}>\frac{1}{8}$$
$$a+\frac{1}{4}-\frac{1}{4}>\frac{1}{8}-\frac{1}{4}$$
$$a>\frac{1-2}{8}$$
$$a>\frac{-1}{8}$$

Therefore the solution set is represented as $\boxed{\{a\,|\,a>-\frac{1}{8}\}}$

The inequality can be represented in the graph with the open circle and heavy arrow mark right to the number $-\frac{1}{8}$.



Answer 37PA.

Consider the following inequality:

$$p-\frac{2}{3}\le\frac{4}{9}$$

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

Simply the given expression

Add $\frac{2}{3}$ on both sides

$$p-\frac{2}{3}\le\frac{4}{9}$$

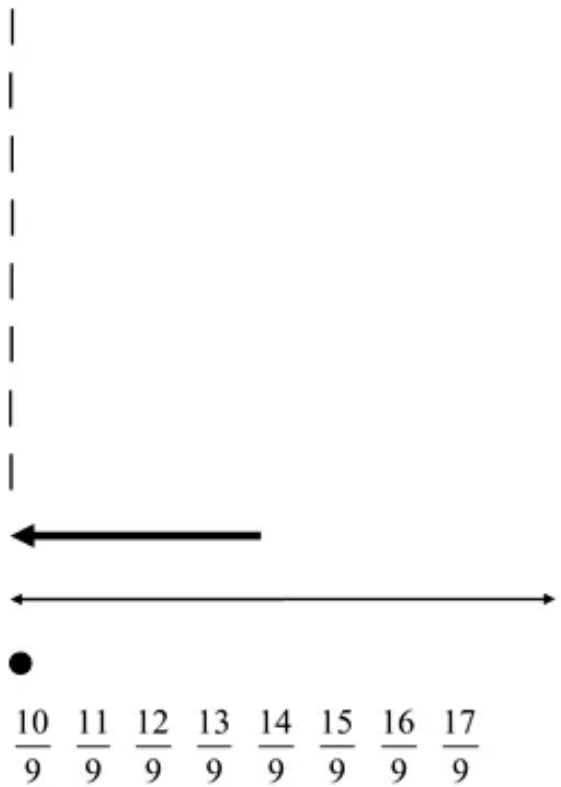
$$p-\frac{2}{3}+\frac{2}{3}\le\frac{4}{9}+\frac{2}{3}$$

$$p\le\frac{4+6}{9}$$

$$p\le\frac{13}{9}$$

Therefore the solution set is represented as $\boxed{\{p\mid p\le\frac{13}{9}\}}$

The inequality can be represented in the graph with the dotted circle and heavy arrow mark left to the number $\frac{13}{9}$.



Answer 38PA.

Consider the following inequality:

$$d+5\geq 17$$

The objective is to solve and compute the given inequality.

(a) The inequality here is to find the value of $d\geq ?$

Simply the given expression

$$d+5\geq 17$$

Subtract 5 on both sides

$$d+5\geq 17$$
$$d+5-5\geq 17-5$$
$$d\geq 12$$

Therefore the solution set is represented as $\boxed{\{d\,|\,d\geq 12\}}$

(b) The inequality here is to find the value of $d+?\geq 20$

Simply the given expression

$d+5\geq 17$

Adding 3 on both sides makes right hand side 20

$d+5+3\geq 17+3$

$d+8\geq 20$

Therefore the inequality here is $\boxed{d+8\geq 20}$

(c) The inequality here is to find the value of $d-5\geq ?$

Simply the given expression

$d+5\geq 17$

Subtract 10 on both sides to give us value of -50on the left hand side inequality

$d+5-10\geq 17-10$

$d-5\geq 7$

Therefore the inequality here is $\boxed{d-5\geq 7}$

Answer 39PA.

Consider the following inequality:

$z-2\leq 10$

The objective is to solve compute the given inequality.

(a) The inequality here is to find the value of $z\leq ?$

Simply the given expression

$z-2\leq 10$

Add 2 on both sides

$z-2\leq 10$

$z-2+2\leq 10+2$

$z\leq 12$

Therefore the solution set is represented as $\boxed{\{z\,|\,z\leq 12\}}$

(b) The inequality here is to find the value of $z-?\le 5$

Simply the given expression

$z-2\le 10$

Subtract 5 on both sides such that it makes the value 5 on right hand side.

$z-2\le 10$

$z-2-5\le 10-5$

$z-7\le 5$

Therefore the inequality is $\boxed{z-7\le 5}$

(c) The inequality here is to find the value of $z+4\le ?$

Simply the given expression

$z-2\le 10$

Add 6 on both sides to give us value of 4 on the left hand side inequality

$z-2\le 10$

$z-2+6\le 10+6$

$z+4\le 16$

Therefore the inequality here is $\boxed{z+4\le 16}$.

Answer 40PA.

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

Consider the number as n and add by 13, at least means greater than equal to. The sum should be 27.

This can be expressed as following inequality

$n+13\ge 27$

Simply the given expression

Subtract 13 on both sides

$n+13\ge 27$

$n+13-13\ge 27-13$

$n\ge 14$

The number is greater than or equal to 14.

The solution set represents $\boxed{\{n\mid n\ge 14\}}$.

Answer 41PA.

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

Consider the number as n, subtract it by 5 and less than 33 means expresser it by lesser than symbol.

This can be expressed as following inequality

$$n-5<33$$

Simply the given expression

Add 5 on both sides

$$n-5<33$$
$$n-5+5<33+5$$
$$n<38$$

The number is less than 38.

The solution set represents $\boxed{\{n \mid n<38\}}$.

Answer 42PA.

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

Consider the number as n, subtract it by 8 and no greater than means less than or equal to 30.

This can be expressed as following inequality

$$30 \le n-8$$

Simply the given expression

Add 8 on both sides

$$30 \le n-8$$
$$30+8 \le n-8+8$$
$$38 \le n$$
$$n \ge 38$$

The number is greater than or equal to 38.

The solution set represents $\boxed{\{n \mid n \ge 38\}}$.

Answer 43PA.

The objective is to write the inequality for the given sentence and solve it.

Consider the number as n, twice the number is 2n, is more than means greater than the sum of that number n and 14.

This can be expressed as following inequality

$$2n > n+14$$

Simply the given expression

Subtract n on both sides

$$2n > n+14$$
$$2n-n > n+14-n$$
$$n > 14$$

The number is greater than 14.

The solution set represents $\boxed{\{n \mid n > 14\}}$.

Answer 44PA.

The objective is to write the inequality for the given sentence and solve it.

Consider the one of the number as n, is at most means less than or equal to. One of the numbers is -7 and sum their sum is equal to 18.

This can be expressed as following inequality

$$n-7 \le 18$$

Simply the given expression

Add 7 on both sides

$$n-7 \le 18$$
$$n-7+7 \le 18+7$$
$$n \le 25$$

The number is less than or equal to 25.

The solution set represents $\boxed{\{n \mid n \le 25\}}$.

Answer 45PA.

The objective is to write the inequality for the given sentence and solve it.

Consider the number as n. Four times means 4n, is less than or equal to sum means plus three times 3n and -2.

This can be expressed as following inequality

$$4n \le 3n-2$$

Simply the given expression

Subtract 3n on both sides

$$4n \le 3n-2$$
$$4n-3n \le 3n-2-3n$$
$$n \le -2$$

The number is less than or equal to -2.

The solution set represents $\boxed{\{n \mid n \le -2\}}$.

Answer 46PA.

The objective is to find how many pounds the young Nile crocodile expected to gain in its life time.

Consider 'r' as the number of pounds young Nile needs to gain.

The weight of adult Nile crocodile can be up to 2200 pounds. The current weight of young Nile is 157 pounds. The amount of weight gained by the young Nile is obtained by summing 157 pounds up with the number r and less than or equal to 2200 pounds.

This can be expressed as following inequality

$$157 + r \le 2200 \text{ pounds}$$

Simply the given expression

$$157 + r \le 2200$$

Subtract 157 on both sides

$$157 + r \le 2200$$
$$157 + r - 157 \le 2200 - 157$$
$$r \le 2043$$

The solution set represents $\{r \mid r \le 2043\}$.

Therefore the number of pounds the young Nile crocodile expected to gain in its life time is $\boxed{2,043 \text{ pounds}}$.

Answer 47PA.

The objective is to find how many stars in the galaxy cannot be seen.

Consider 'r' as the number stars that cannot be seen.

The total number of stars in the Milky Way is at least (greater or equal to) 200 billion. The number of stars that can be seen without telescope is 1100. The number of starts that cannot be seen is obtained by summing up 1100 with the number r and greater or equal to 200 billion.

This can be expressed as following inequality

$$1100 + r \ge 200 \text{ billion}$$

Simply the given expression

$$1100 + r \geq 200 \text{ billion}$$

Subtract 1100 on both sides

$$1100 + r \geq 200 \text{ billion}$$
$$1100 + r - 1100 \geq 200 \text{ billion} - 1100 \quad 1 \text{ billion} = 1,000,000,000$$
$$r \geq 199.9999989 \text{ billion}$$

The solution set represents $\{r \mid r \geq 199.9999989 \text{ billion}\}$.

Therefore the number of stars in the galaxy that cannot be seen is used naked eye is $\boxed{r \geq 199.9999989 \text{ billion}}$.

Answer 48PA.

The objective is to find how many species of insects are not bees.

Consider 'r' as the number of species of insects that are not bees.

The total numbers of species of insects are more than (greater than) 600,000. The numbers of species of bees are 3500. The number of species of insects that are not bees is obtained by summing up 3500 with the number r and greater than 600,000.

This can be expressed as following inequality

$$3500 + r > 600,000$$

Simply the given expression

$$3500 + r > 600,000$$

Subtract 3500 on both sides

$$3500 + r > 600,000$$
$$3500 + r - 3500 > 600,000 - 3500$$
$$r > 596,500$$

The solution set represents $\{r \mid r > 596,500\}$.

Therefore the numbers of species of insects are not bees are $\boxed{r > 596,500}$.

Answer 49PA.

The objective is to find how much money Mr Hayashi should maintain his accounts before writing his checks.

Consider 'r' as the money that Mr Hayashi should maintain in his City Bank account to write his checks.

The total minimum balance he should maintain is $1500. The checks he wanted to write are $1300 and $947. The amount he should maintain is obtained by summing up -1500 with the number r and greater than or equal to sum of $1300 and $947.

This can be expressed as following inequality

$$r-1500 \geq 1300+947$$

Simply the given expression

$$r-1500 \geq 1300+947$$

Add 1500 on both sides

$$r-1500 \geq 1300+947$$
$$r-1500+1500 \geq 1300+947+1500$$
$$r \geq \$3,747$$

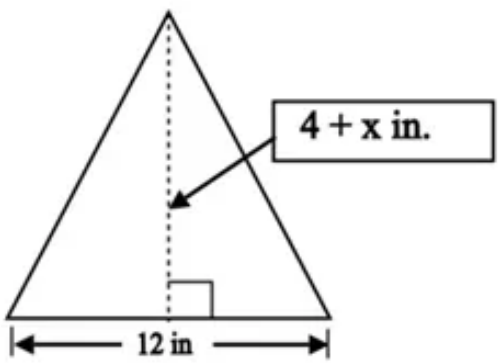
The solution set represents $\{r \mid r \geq \$3,747\}$.

Therefore the amount of money Mr Hayashi should maintain in his account before writing his checks is $\boxed{r \geq \$3,747}$.

Answer 50PA.

The objective is to find the possible values of x.

Consider the following figure



The length of the base of the triangle is 12 in. The base of the triangle is less than height of the triangle which is $4+x$ in .

This can be expressed as following inequality

$$12<4+x$$

Simply the given expression

$$12<4+x$$

Subtract 4 on both sides

$$12<4+x$$
$$12-4<4+x-4$$
$$8<x$$
$$x>8$$

The solution set represents $\{x \mid x>8\}$.

Therefore all the possible values of x are $\boxed{x>8}$.

Answer 51PA.

The objective is to find how much amount of Terrell can spend on jeans.

Consider 'r' as the money that Terrell can spend to buy pair of jeans.

The total money he can spend is \$65. He spent \$18 for T-shirt and \$14 for belt. The amount remaining is obtained by summing up \$18 and \$14 with the number r and less than or equal to \$65.

This can be expressed as following inequality

$$r+14+18\le 65$$

Simply the given expression

$$r+32\le 65$$

Subtract 32 on both sides

$$r+32\le 65$$
$$r+32-32\le 65-32$$
$$r\le 33$$

The solution set represents $\{r \mid r\le 33\}$.

Therefore the amount Terrell can spend on jeans is $\boxed{r\le \$33}$.

Answer 52PA.

Simply the given expression

$r+4\geq 11$

Subtract 4 on both sides

$r+4\geq 11$

$r+4-4\geq 11-4$

$r\geq 7$

The solution set represents $\{r\,|\,r\geq 7\}$.

Therefore the number of games the team must win to meet their goal is $\boxed{r\geq 7}$.

Answer 53PA.

The objective is to understand and check the trueness of the inequality.

(a) Consider some values for a, b,c and d which satisfies the given inequalities

$a=2,b=3$

$c=3,d=4$

This satisfies $a<b,c<d$

Now consider the expression

$a+c<b+d$

Use the above values in the above expression

$a+c<b+d$

$2+3<3+4$

$5<7$

This statement is always true.

The statement can be always true even if you assumes different numbers for a, b,c and d which satisfies the given inequalities

Therefore the given inequality is always true.

(b) Consider some values for a, b,c and d which satisfies the given inequalities

$a=2,b=3$

$c=3,d=4$

This satisfies $a<b,c<d$

Now consider the expression

$a+c\geq b+d$

Use the above values in the above expression

$a+c\geq b+d$

$2+3\geq 3+4$

$5\not\geq 7$

This statement never can be true.

The statement can never be true even if you assumes different numbers for a, b,c and d which satisfies the given inequalities

Therefore the given inequality is never true.

(c) Consider some values for a, b,c and d which satisfies the given inequalities

$a=2, b=3$

$c=3, d=4$

This satisfies $a<b, c<d$

Now consider the expression

$a-c=b-d$

Use the above values in the above expression

$a-c=b-d$

$2-3=3-4$

$-1=-1$

This statement is true.

Let us consider different values

$a=5, b=10$

$c=-2, d=2$

Now consider the expression

$a-c=b-d$

Use the above values in the above expression

$a-c=b-d$

$5-(-2)=10-2$

$7 \neq 8$

This statement is false.

Therefore the given inequality is sometimes true.

Answer 54PA.

The objective is to find how much cholesterol level Hector should reduce and write that in a inequality form.

Consider 'p' as the number of points Hector should lower his cholesterol.

Hector has a cholesterol level of 225. Doctor advised to reduce the cholesterol level below 200. The number of points that Hector should reduce is obtained by summing up -200 with the number p and less than 225.

This can be expressed as following inequality

$225-p<200$

Therefore the inequality of the given problem is $\boxed{225-p<200}$.

Answer 55PA.

The objective is to find how much cholesterol level Hector should reduce.

Consider 'p' as the number of points Hector should lower his cholesterol.

Hector has a cholesterol level of 225. Doctor advised to reduce the cholesterol level below 200. The number of points that Hector should reduce is obtained by summing up -200 with the number p and less than 225.

This can be expressed as following inequality

$$225 - p < 200$$

Simply the expression to obtain the given inequality

$$225 - p < 200$$

Subtract 200 on both sides

$$225 - p < 200$$
$$225 - p - 200 < 200 - 00$$
$$25 - p < 0$$
$$p > 25$$

Therefore the cholesterol level Hector should reduce is $\boxed{p > 25}$.

Answer 56PA.

The objective is to describe the inequalities used to describe school sports that high school girls played in year 1999-200 and show the number of schools that needed to add girls' track and field greater than number of girls' playing basketball.

Consider 'r' as the number of schools needs to add girls' track and field.

The total number of girls participating in basketball is 16,526. The current tracks and fields offer by the schools are 14,587. The number of schools that needed to add girls' track and field greater than number of girls' playing basketball is obtained by summing up 14,578 with the number r should be greater than 16,525.

This can be expressed as following inequality

$$r + 14,587 > 16,256$$

Simply the expression

$r+14,587>16,256$

Subtract 14587 on both sides

$r+14,587>16,256$

$r+14,587-14587>16,256-14587$

$r>1,669$

$$\begin{array}{r} {}^{5}1\,6,{}^{11}2^{14}5^{1}6 \\ -\ 14587 \\ \hline 1669 \end{array}$$

Therefore the number of schools that needed to add girls' track and field greater than number of girls' playing basketball is $\boxed{r>1,669}$.

Answer 57PA.

Consider the following inequality:

$x\le 12$

The objective is to solve and compute the given inequality and check with the given options.

(a)

Simply the given expression

$x-7\le 5$

Add 7 on both sides

$x-7\le 5$

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

$x\le 12$

Therefore the given expression is not the answer as it satisfies the given inequality.

(b) Simply the given expression

$x+4\le 16$

Subtract 4 on both sides

$x+4\le 16$

$x+4-4\le 16-4$

$x\le 12$

Therefore the given expression is not the answer as it satisfies the given inequality.

(c) Simply the given expression

$x-1\le 13$

Add 1 on both sides

$x-1\le 13$

$x-1+1\le 13+1$

$x\le 14$

Therefore the inequality is not equivalent to $x\le 12$. $\boxed{c}$

(d) Simply the given expression

$12 \geq x$

$x \leq 12$

Therefore the given expression is not the answer as it satisfies the given inequality.

Answer 58PA.

Consider the following inequality:

$n+6 \geq 5$

The objective is to solve and compute the given inequality and check with the given options.

(a)

The sum of a number and six is at least five.

This statement can be expressed as

$\underbrace{a \text{ number}}_{n}\ \text{sum six}\ \underbrace{\text{at least}}_{\geq}\ \underbrace{\textit{five}}_{5}$

$n+6 \geq 5$

Therefore the statement is the answer as it satisfies the given inequality. $\boxed{a}$

(b) The sum of a number and six is at most five.

This statement can be expressed as

$\underbrace{a \text{ number}}_{n}\ \text{sum six}\ \underbrace{\text{at most}}_{\leq}\ \underbrace{\textit{five}}_{5}$

$n+6 \leq 5$

Therefore the statement doesn't satisfy the given inequality.

(c) The sum of a number and six is greater than five.

This statement can be expressed as

$\underbrace{a \text{ number}}_{n}\ \text{sum six}\ \underbrace{\text{greater than}}_{>}\ \underbrace{\textit{five}}_{5}$

$n+6 > 5$

Therefore the statement doesn't satisfy the given inequality.

(d) The sum of a number and six is no more than five.

This statement can be expressed as

$\underbrace{a \text{ number}}_{n}\ \text{sum six}\ \underbrace{\text{no more than}}_{\leq}\ \underbrace{\textit{five}}_{5}$

$n+6 \leq 5$

Therefore the statement doesn't satisfy the given inequality.

Answer 59MYS.

The objective is to find the relationship between person's relationship and math test grade.

Let us consider the following table regarding person's math grade and age.

Math Grade	Age
A+	10
A	12
B	14
C	16

From the above table it is evident that it is difficult to relate math grade vs age.

Therefore the relationship between a person's height to the person's grade in math test cannot have any relation.

Answer 60MYS.

The objective is to write the equation in slope-intercept form the passes through the given point and parallel to given equation.

The equation of line representing the slope intercept form is

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

For a parallel line the slope remains same.

So from the given equation the slope can be obtained, use the slope and a line that passes through the point will provide us a parallel line.

Consider the given equation

$y = 3x - 2$

This equation is a representative of line that in slope intercept form.

Hence slope is $m = 3$

The given point is $(1, -3)$

The equation of a line that passes through a point (x_1, y_1) and having slope m is expressed as

$y - y_1 = m(x - x_1)$

Here $m = 3, (x_1, y_1) = (1, -3)$

On substitution

$y - (-3) = 3(x - 1)$

$y + 3 = 3x - 3$

$y = 3x - 3 - 3$

$y = 3x - 6$

Therefore the equation of the line is $\boxed{y = 3x - 6}$.

Answer 61MYS.

The objective is to write the equation in slope-intercept form the passes through the given point and parallel to given equation.

The equation of line representing the slope intercept form is

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

For a parallel line the slope remains same.

So from the given equation the slope can be obtained, use the slope and a line that passes through the point will provide us a parallel line.

Consider the given equation

$x + y = -3$

Writing it in slope intercept form

$y = -x - 3$

This equation is a representative of line that in slope intercept form.

Hence slope is $m = -1$

The given point is $(0,4)$

The equation of a line that passes through a point (x_1, y_1) and having slope m is expressed as

$y - y_1 = m(x - x_1)$

Here $m = -1, (x_1, y_1) = (0,4)$

On substitution

$y - 4 = -1(x - 0)$

$y - 4 = -x$

$y = -x + 4$

Therefore the equation of the line is $\boxed{y = -x + 4}$.

Answer 62MYS.

The objective is to write the equation in slope-intercept form the passes through the given point and parallel to given equation.

The equation of line representing the slope intercept form is

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

For a parallel line the slope remains same.

So from the given equation the slope can be obtained, use the slope and a line that passes through the point will provide us a parallel line.

Consider the given equation

$2x - y = 1$

Writing it in slope intercept form

$y = 2x - 1$

This equation is a representative of line that in slope intercept form.

Hence slope is $m = 2$

The given point is $(-1, 2)$

The equation of a line that passes through a point (x_1, y_1) and having slope m is expressed as

$y - y_1 = m(x - x_1)$

Here $m = 2, (x_1, y_1) = (-1, 2)$

On substitution

$y - 2 = 2(x - (-1))$

$y - 2 = 2x + 2$

$y = 2x + 4$

Therefore the equation of the line is $\boxed{y = 2x + 4}$.

Answer 63MYS.

Consider the following sequence

$$7,13,19,25,...$$

The objective is to find the next two terms in each sequence.

Start with subtracting the two consecutive numbers

$$13-7=6$$
$$19-13=6$$
$$25-19=6$$

This tells us that the difference between two connective numbers will be 6.

Hence add 6 to 25 which give us 31, similarly add 6 to 31 which give us 37.

Therefore the sequence of the numbers is $\boxed{7,13,19,25,31,37}$.

Answer 64MYS.

Consider the following sequence

$$243,81,27,9,...$$

The objective is to find the next two terms in each sequence.

Start with subtracting the two consecutive numbers

$$243-81=162$$
$$81-27=54$$
$$27-9=18$$

This does not give any relationship.

Now consider dividing the two consecutive numbers

$$243\div 81=3$$
$$81\div 27=3$$
$$27\div 9=3$$

This tells us that the two connective numbers will be divided by 3.

Hence divide 9 by 3 which give us 3, similarly divide 3 by3 which give us 1.

Therefore the sequence of the numbers is $\boxed{243,81,27,9,3,1}$.

Answer 65MYS.

Consider the following sequence

$3,6,12,24,...$

The objective is to find the next two terms in each sequence.

Start with subtracting the two consecutive numbers

$6-3=3$

$12-6=6$

$21-12=12$

This does not give any relationship.

Now consider dividing the two consecutive numbers

$6\div 3=2$

$12\div 6=2$

$24\div 12=2$

This tells us that the two connective numbers are multiplies of 2.

Hence multiply 24 with 2 which give us 48, similarly 48 with 2 which give us 96.

Therefore the sequence of the numbers is $\boxed{3,6,12,24,48,96}$.

Answer 66MYS.

Consider the following equation

$y=-2x$

The objective is to solve the equation within the domain $\{-1,3,5\}$

Substitute each value of x to obtain the corresponding value of y.

For $x=-1$

$$\begin{aligned} y&=-2x\\ &=-2\times -1\\ &=2 \end{aligned}$$

The solution set is $\boxed{(-1,2)}$.

For $x=3$

$$\begin{aligned} y&=-2x\\ &=-2\times 3\\ &=-6 \end{aligned}$$

The solution set is $\boxed{(3,-6)}$.

For $x=5$

$$\begin{aligned} y &= -2x \\ &= -2\times 5 \\ &= -10 \end{aligned}$$

The solution set is $\boxed{(5,-10)}$.

Answer 67MYS.

Consider the following equation

$$y = 7 - x$$

The objective is to solve the equation within the domain $\{-1,3,5\}$

Substitute each value of x to obtain the corresponding value of y.

For $x=-1$

$$\begin{aligned} y &= 7 - x \\ &= 7 - (-1) \\ &= 8 \end{aligned}$$

The solution set is $\boxed{(-1,8)}$.

For $x=3$

$$\begin{aligned} y &= 7 - x \\ &= 7 - 3 \\ &= 4 \end{aligned}$$

The solution set is $\boxed{(3,4)}$.

For $x=5$

$$\begin{aligned} y &= 7 - x \\ &= 7 - 5 \\ &= 2 \end{aligned}$$

The solution set is $\boxed{(5,2)}$.

Answer 68MYS.

Consider the following equation

$$2x-y=6$$

The objective is to solve the equation within the domain $\{-1,3,5\}$

Substitute each value of x to obtain the corresponding value of y.

Simply the equation

$$y=2x-6$$

For $x=-1$

$$\begin{aligned} y&=2x-6\\ &=2(-1)-6\\ &=-8 \end{aligned}$$

The solution set is $\boxed{(-1,-8)}$.

For $x=3$

$$\begin{aligned} y&=2x-6\\ &=2(3)-6\\ &=0 \end{aligned}$$

The solution set is $\boxed{(3,0)}$.

For $x=5$

$$\begin{aligned} y&=2x-6\\ &=2\times5-6\\ &=4 \end{aligned}$$

The solution set is $\boxed{(5,4)}$.

Answer 69MYS.

Consider the following equation

$$6g=42$$

The objective is to solve the equation.

Simplify the equation by dividing both sides by 6.

$$\begin{aligned} 6g&=42\\ \frac{6g}{6}&=\frac{42}{6}\\ g&=7 \end{aligned}$$

Therefore the solution is $\boxed{g=7}$.

Answer 70MYS.

Consider the following equation

$$\frac{t}{9}=14$$

The objective is to solve the equation.

Simplify the equation by multiplying both sides by 9.

$$\frac{t}{9}=14$$

$$\frac{t}{9}\times 9=14\times 9 \qquad 14\times 9=126$$

$$t=126$$

Therefore the solution is $\boxed{t=126}$.

Answer 71MYS.

Consider the following equation

$$\frac{2}{3}y=14$$

The objective is to solve the equation.

Simplify the equation by multiplying both sides by 3.

$$\frac{2}{3}y=14$$

$$\frac{2}{\cancel{3}}y\times \cancel{3}=14\times 3 \qquad 14\times 3=42$$

$$2y=42$$

$$y=\frac{42}{2}=21$$

Therefore the solution is $\boxed{y=21}$.

Answer 72MYS.

Consider the following equation

$$3m=435$$

The objective is to solve the equation.

Simplify the equation by dividing both sides by 3.

$$3m=435$$

$$\frac{\cancel{3}m}{\cancel{3}}=\frac{435}{3} \qquad 3\times 145=435$$

$$m=145$$

Therefore the solution is $\boxed{m=145}$.

Answer 73MYS.

Consider the following equation

$$\frac{4}{7}x = 28$$

The objective is to solve the equation.

Simplify the equation by multiplying both sides by $\frac{7}{4}$.

$$\frac{4}{7}x = 28$$

$$\frac{\cancel{4}}{\cancel{7}}x \times \frac{\cancel{7}}{\cancel{4}} = \cancel{28}^{7} \times \frac{7}{\cancel{4}} \quad 7 \times 7 = 49$$

$$x = 7 \times 7$$

$$x = 49$$

Therefore the solution is $\boxed{x = 49}$.

Answer 74MYS.

Consider the following equation

$$5.3g = 11.13$$

The objective is to solve the equation.

Simplify the equation by dividing both sides by 5.3.

$$5.3g = 11.13$$

$$\frac{5.3g}{5.3} = \frac{11.13}{5.3}$$ Use calculation to obtain $\frac{11.13}{5.3} = 2.1$

$$g = 2.1$$

Therefore the solution is $\boxed{g = 2.1}$.

Answer 75MYS.

Consider the following equation

$$\frac{a}{3.5} = 7$$

The objective is to solve the equation.

Simplify the equation by multiplying both sides by 3.5.

$$\frac{a}{3.5} = 7$$

$$\frac{a}{3.5} \times 3.5 = 7 \times 3.5 \quad 7 \times 3.5 = 24.5$$

$$a = 24.5$$

Therefore the solution is $\boxed{a = 24.5}$.

Answer 76MYS.

Consider the following equation

$$8p = 35$$

The objective is to solve the equation.

Simplify the equation by dividing both sides by 8.

$$8p = 35$$

$$\frac{\cancel{8}\,p}{\cancel{8}} = \frac{35}{8}$$

$$p = \frac{35}{8}$$

Therefore the solution is $\boxed{p = \frac{35}{8}}$.