Chapter 2 Linear Equations and Functions

Ex 2.3

Answer 1e.

We know that the equation $y = mx + b$ is said to be in slope-intercept form. The given equation is of the form $y = mx + b$, where m is 2, and b is 5.

Therefore, the given statement can be completed as:
The linear equation $y = 2x + 5$ is written in slope-intercept form.

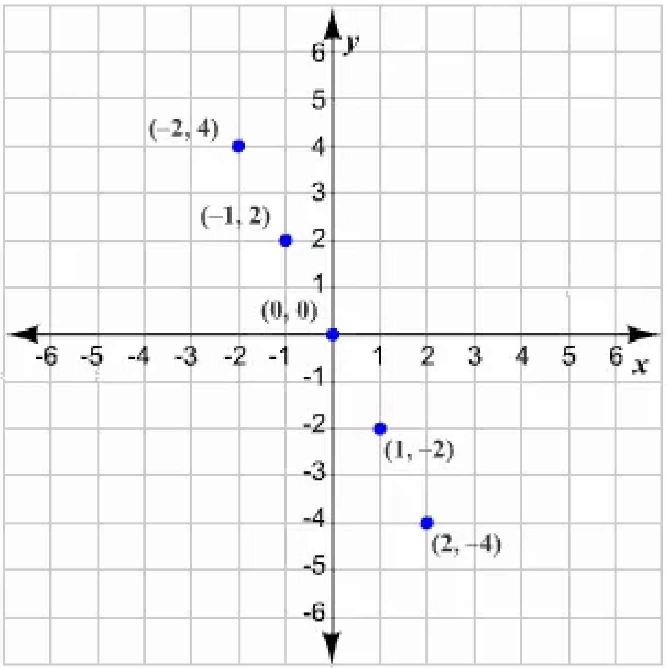
Answer 1gp.

We have to find some points that satisfy the equation. For this, choose some values for x and evaluate the corresponding values of y.

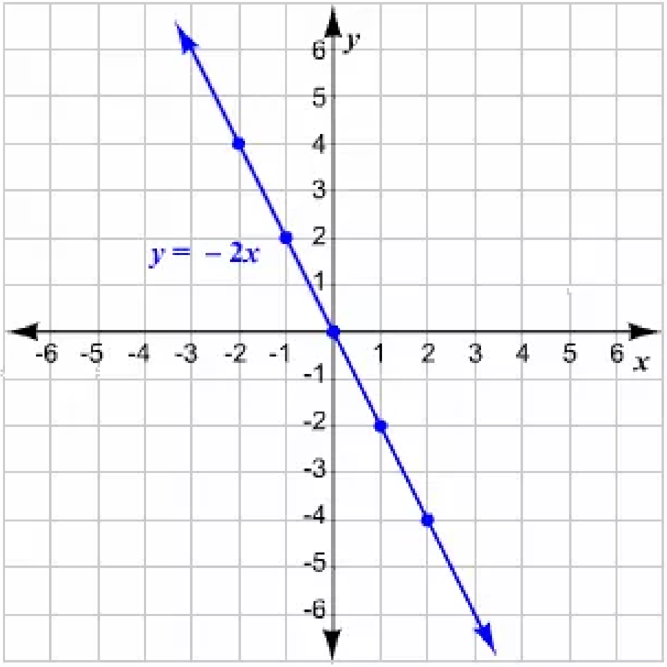
x	-2	-1	0	1	2
$y = -2x$	4	2	0	-2	-4

The points are (–2, 4), (–1, 2), (0, 0), (1, –2), and (2, –4).

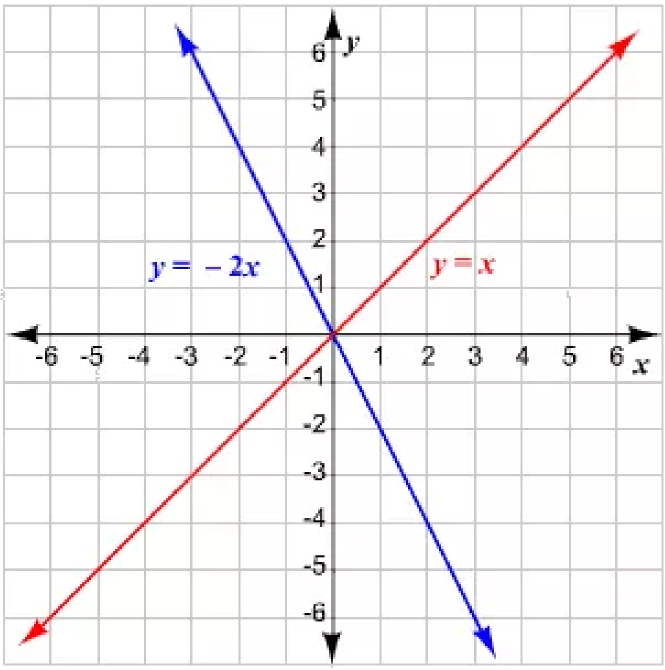
Plot the points on a coordinate plane.



Connect the points with a straight line.



Similarly, graph the equation $y = x$ on the same coordinate plane.



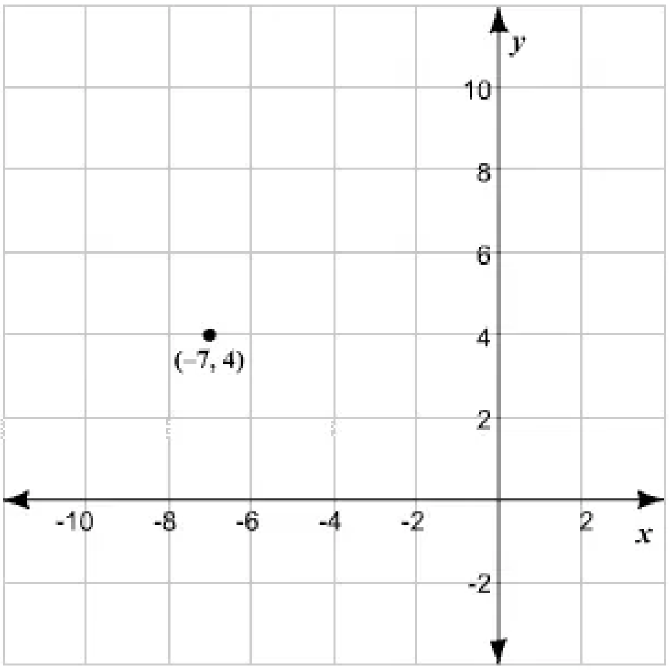
On comparing, we can see that both the graphs have a y-intercept of 0, but the graph of $y = -2x$ has a slope of -2 instead of 1.

Answer 1q.

Step 1 The given function is of the form $y = |x - h| + k$, where (h, k) is the vertex of the function.

We get the value of h as -7 and of k as 4. Thus, the vertex is $(-7, 4)$.

Plot the vertex of the given function.



Step 2 Use symmetry to find two more points.

Rewrite the function.

$$y - 4 = |x + 7| + 4 - 4$$

$$|x + 7| = y - 4$$

We know that $|x + 7|$ is always positive. This means that y will be greater than or equal to 4. Thus, substitute a value, say, 5 for y.

$$|x + 7| = 5 - 4$$

$$= 1$$

We get $x + 7 = 1$ and $x + 7 = -1$.

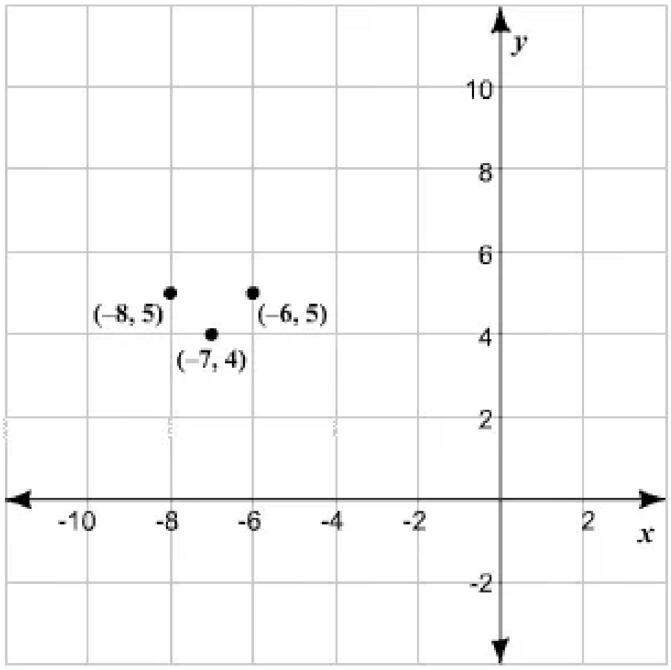
Subtract 7 from both the sides of the two equations.

$$x + 7 - 7 = 1 - 7 \quad \text{and} \quad x + 7 - 7 = -1 - 7$$

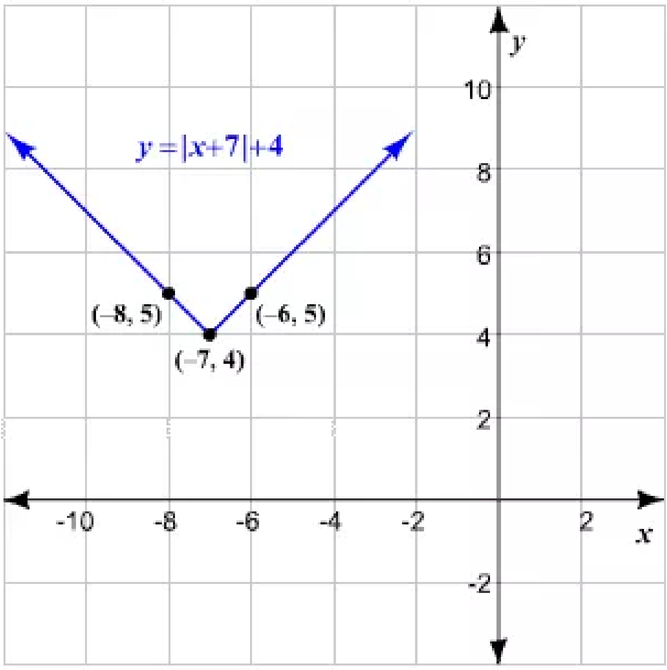
$$x = -6 \quad \text{and} \quad x = -8$$

The two points are $(-6, 5)$ and $(-8, 5)$.

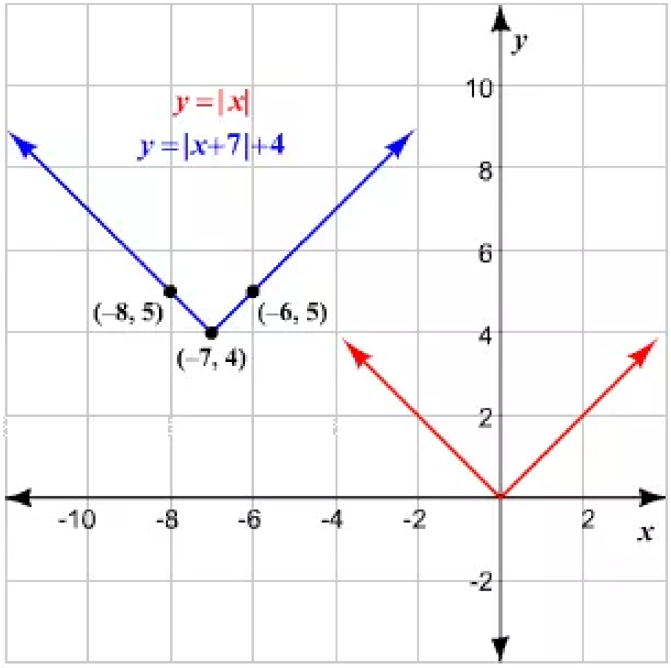
Plot these points on the graph.



Step 3 Connect the points using straight lines to obtain a V-shaped graph.



Step 4 Similarly, graph $y = |x|$ on the same axis.



It is clear from the figure that the graph of $y = |x + 7| + 4$ is the graph of $y = |x|$ translated up 4 units and 7 units left.

Answer 2e.

The standard form of a linear equation is

$$Ax + By = C$$

where A and B are non zero.

Here we need to describe how to graph an equation of the form $Ax + By = C$.

To describe how to graph an equation of the form $Ax + By = C$ first we write the equation in standard form.

Then, we identify the x-intercept by letting $y = 0$ and solving for x. And we use x-intercept to plot the point where the line crosses the x-axis.

After that we identify the y-intercept by letting $x = 0$ and solving for y. And then we use y-intercept to plot the point where the line crosses the y-axis.

Finally we draw a line through the two points.

In this way we graph an equation of the form $Ax + By = C$.

Answer 2gp.

We need to compare the graph of the given equation $y = x - 2$ with the graph of the equation $y = x$.

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (2), we have

$$y = x - 2$$

$$y = 1 \cdot x + (-2) \qquad \text{...... (2)}$$

Comparing the equation (2) with the equation (1), we have

$$m = 1, b = -2$$

The graph of (2) is a line with the slope 1 and y-intercept -2.

Comparing the equation $y = x$ with the equation (1), we have

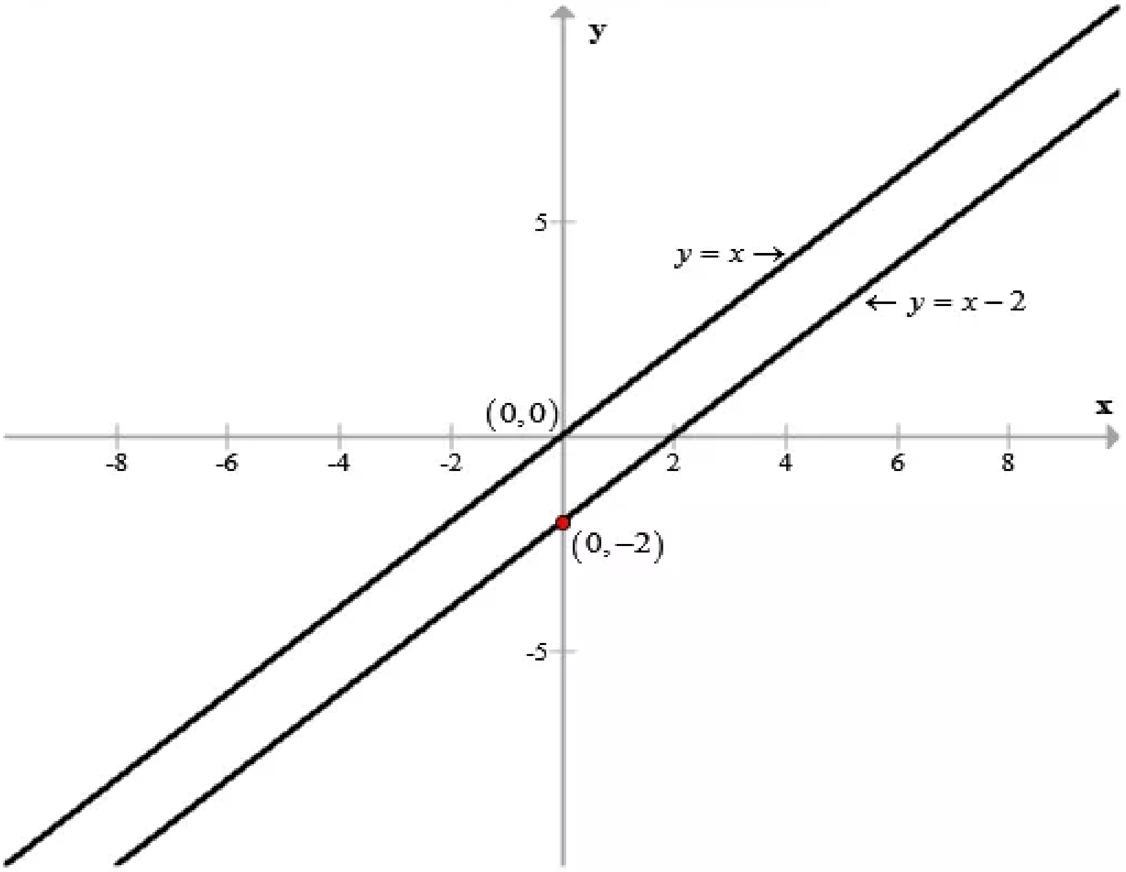
$$y = x$$

$$y = 1 \cdot x + 0$$

$$m = 1, b = 0 \qquad \text{...... (3)}$$

The graph of (3) is a line with the slope 1 and y-intercept 0.

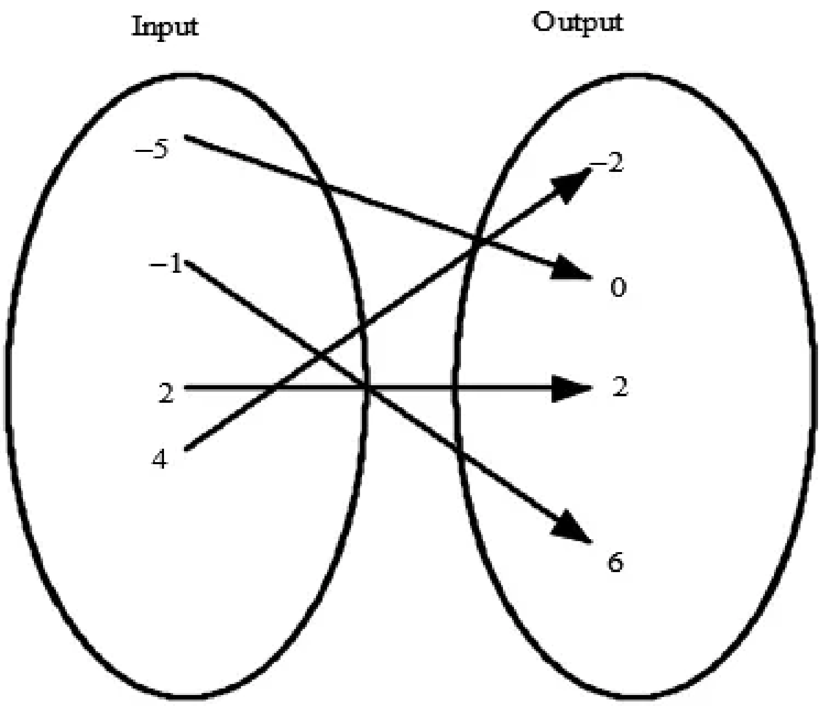
The graph of the equation $y = x - 2$ and $y = x$ are given below:



Therefore the graphs of $y = x - 2$ and $y = x$ both have a slope of 1, but the graph of $y = x - 2$ has a y-intercept of -2 instead of 0.

Answer 2q.

Given relation is



...... (1)

Here we need to say the given relation is a function or not.

A function is a relation in which NO two ordered pairs have the same first coordinate. the given relation (1), is a function because none of the four ordered pairs have the same first coordinate.

So, we can say that the given relation (1), is a function.

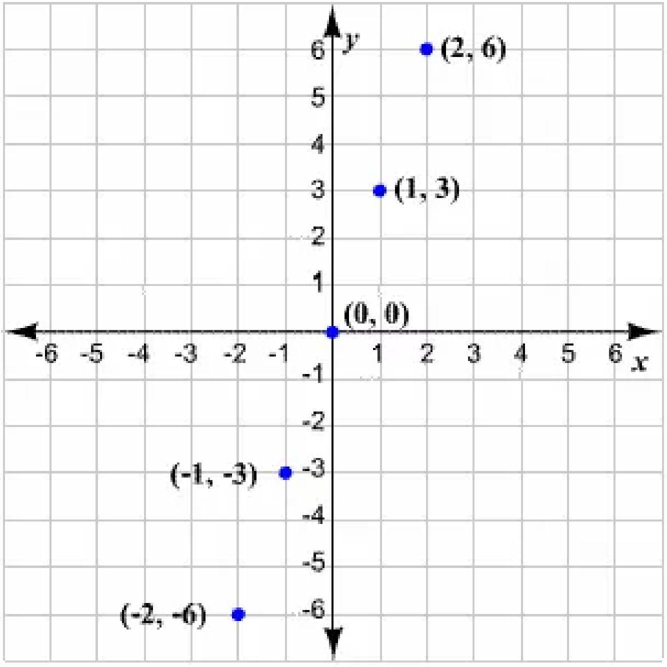
Answer 3e.

We have to find some points that satisfy the equation. For this, choose some values for x and evaluate the corresponding values of y.

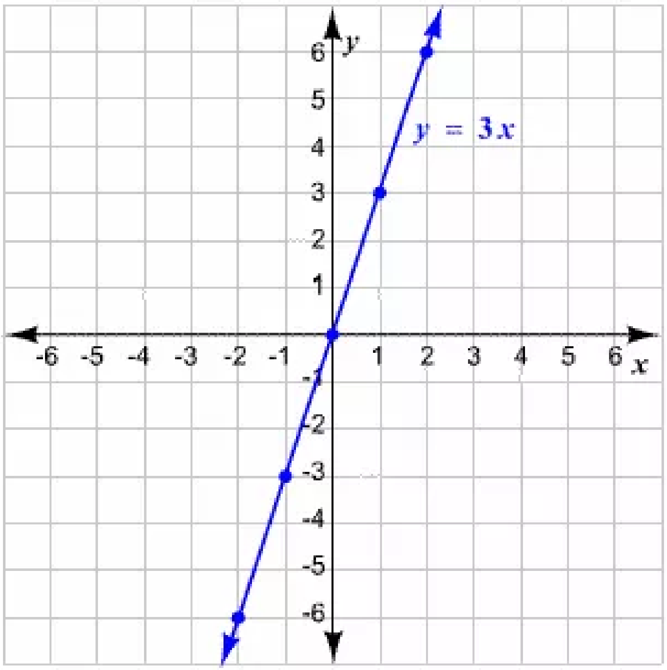
x	−2	−1	0	1	2
$y = 3x$	−6	−3	0	3	6

The points are (−2, −6), (−1, −3), (0, 0), (1, 3), and (2, 6).

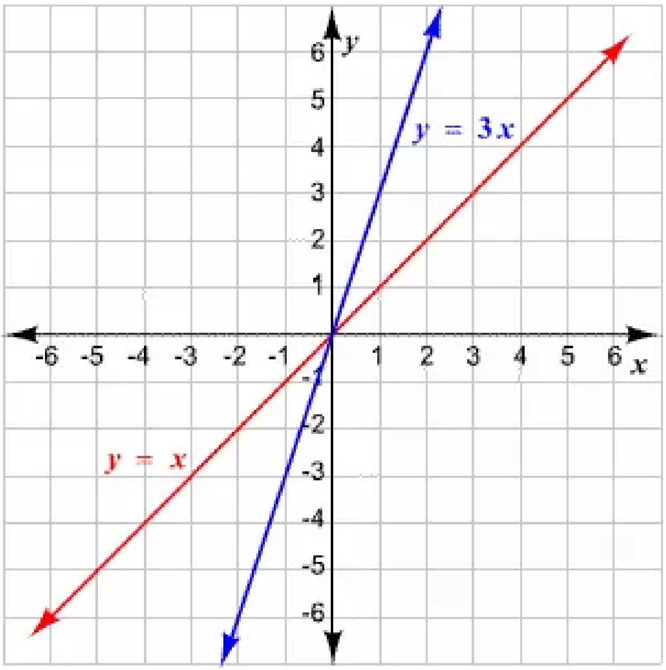
Plot the points on a coordinate plane.



Connect the points with a straight line.



Similarly, graph the equation $y = x$ on the same coordinate plane.



On comparing, we can see that both the graphs have a y-intercept of 0, but the graph of $y = 3x$ has a slope of 3 instead of 1.

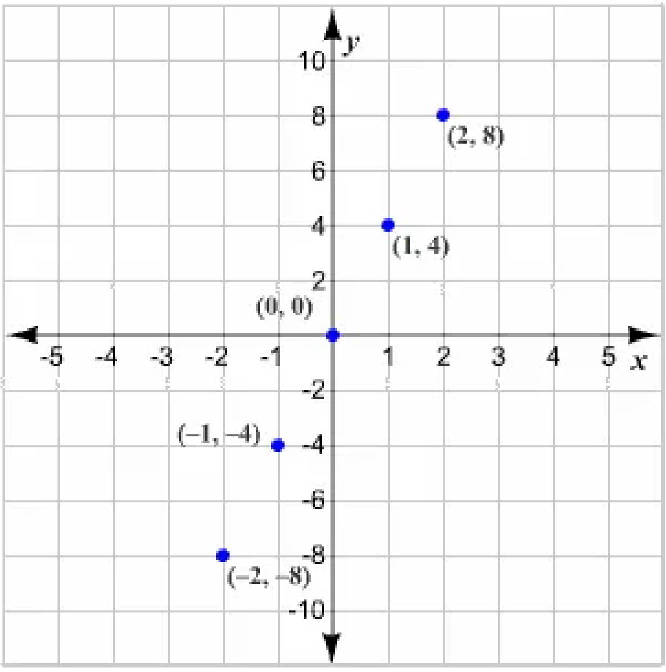
Answer 3gp.

We have to find some points that satisfy the equation. For this, choose some values for x and evaluate the corresponding values of y.

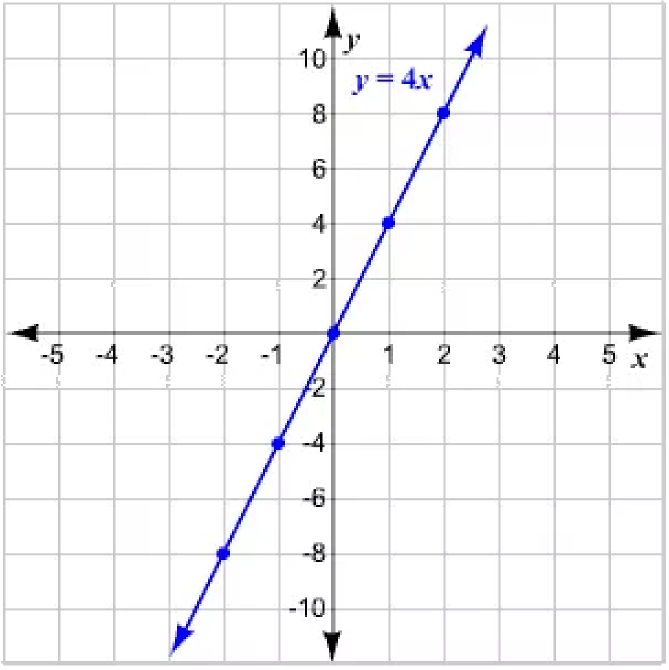
x	-2	-1	0	1	2
$y = 4x$	-8	-4	0	4	8

The points are $(-2, -8)$, $(-1, -4)$, $(0, 0)$, $(1, 4)$, and $(2, 8)$.

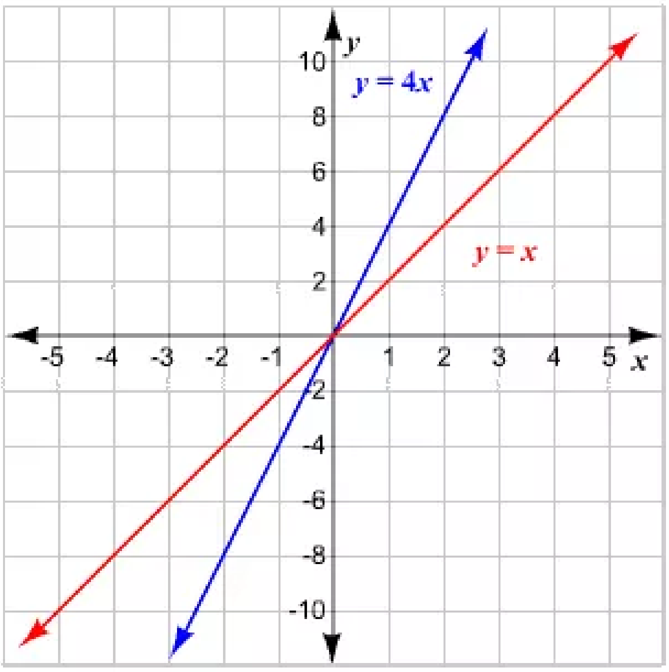
Plot the points on a coordinate plane.



Connect the points with a straight line.



Similarly, graph the equation $y = x$ on the same coordinate plane.



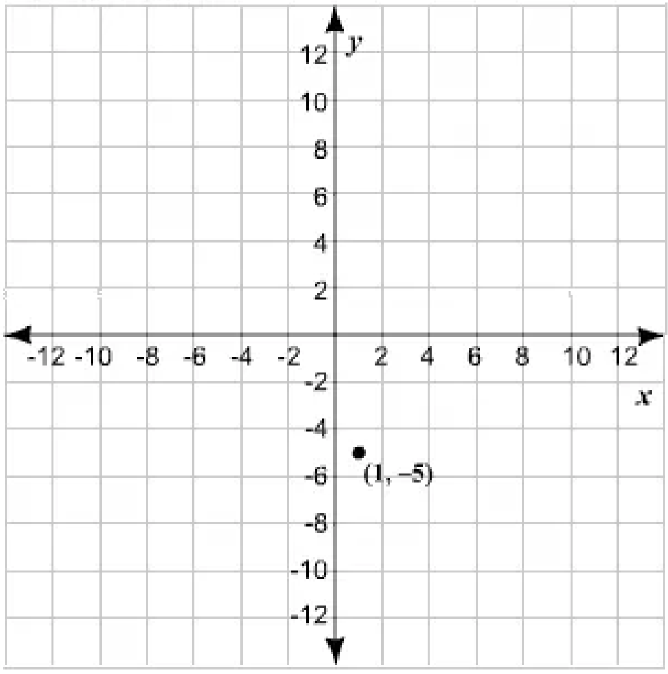
On comparing, we can see that both the graphs have a y-intercept of 0, but the graph of $y = 4x$ has a slope of 4 instead of 1.

Answer 3q.

Step 1 The given function is of the form $y = |x - h| + k$, where (h, k) is the vertex of the function.

We get the value of h as 1 and of k as -5. Thus, the vertex of the given function is $(1, -5)$.

Plot the vertex.



Step 2 Use symmetry to find two more points.

Substitute any value, say, 0 for y in the given function.

$$0 = \frac{1}{2}|x-1| - 5$$

Add 5 to both the sides of the equation.

$$0+5 = \frac{1}{2}|x-1| - 5 + 5$$

$$5 = \frac{1}{2}|x-1|$$

Multiply both sides by 2.

$$5(2) = \frac{1}{2}|x-1|(2)$$

$$10 = |x-1|$$

We get $x-1=10$ and $x-1=-10$.

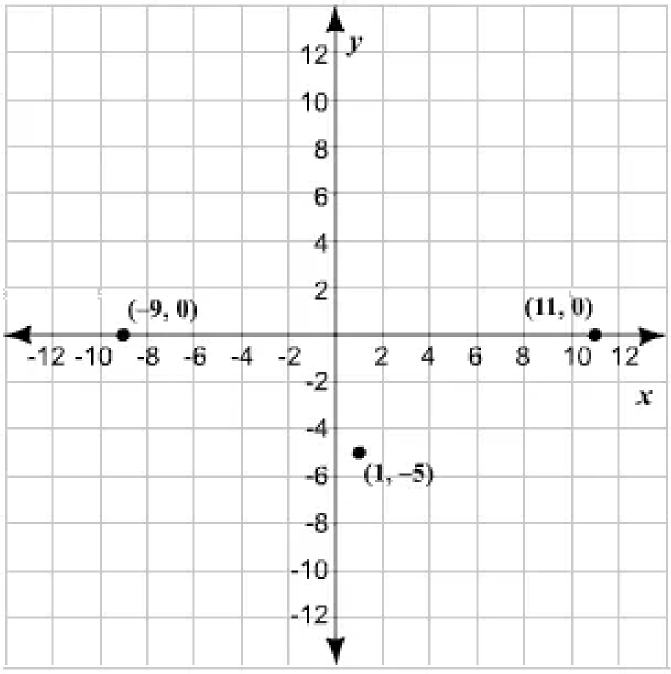
Add 1 to both the sides of the two equations.

$x-1+1 = 10+1$ and $x-1+1 = -10+1$

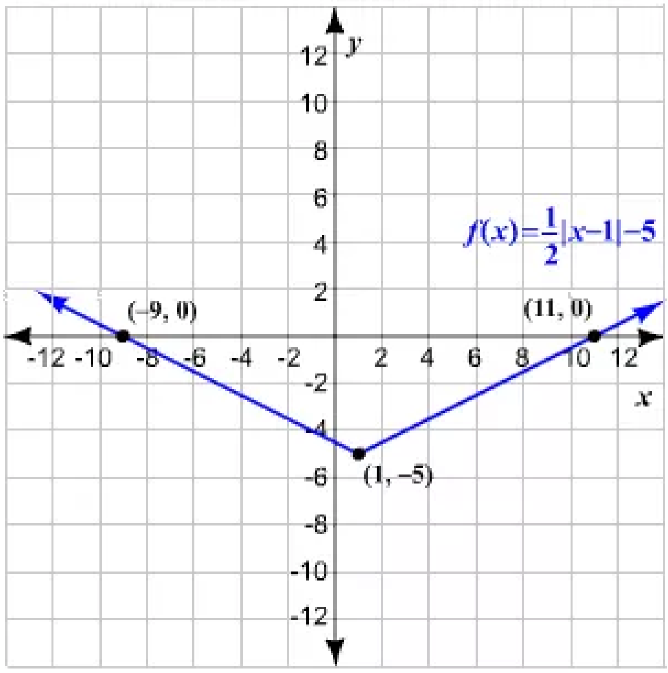
$x = 11$ and $x = -9$

The two points are (11, 0) and (–9, 0).

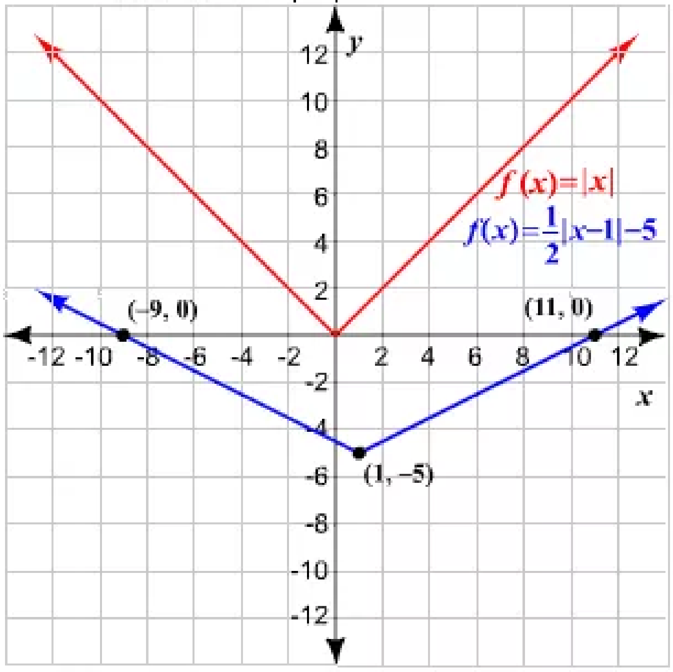
Plot these points on the graph.



Step 3 Connect the points using straight lines to obtain a V-shaped graph.



Step 4 Similarly, graph $y = |x|$ on the same axis.



It is clear from the figure that the graph of $y = \frac{1}{2}|x-1| - 5$ is the graph of $y = |x|$ vertically shrunk by a factor of $\frac{1}{2}$, translated 1 unit to the right and shifted down by 5 units.

Answer 4e.

We need to compare the graph of the given equation $y = -x$ with the graph of the equation $y = x$.

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (2), we have

$$y = -x$$

$$y = (-1) \cdot x \qquad \text{...... (2)}$$

Comparing the equation (2) with the equation (1), we have

$$m = -1, b = 0$$

The graph of (2) is a line with the slope -1 and y-intercept 0.

Comparing the equation $y = x$ with the equation (1), we have

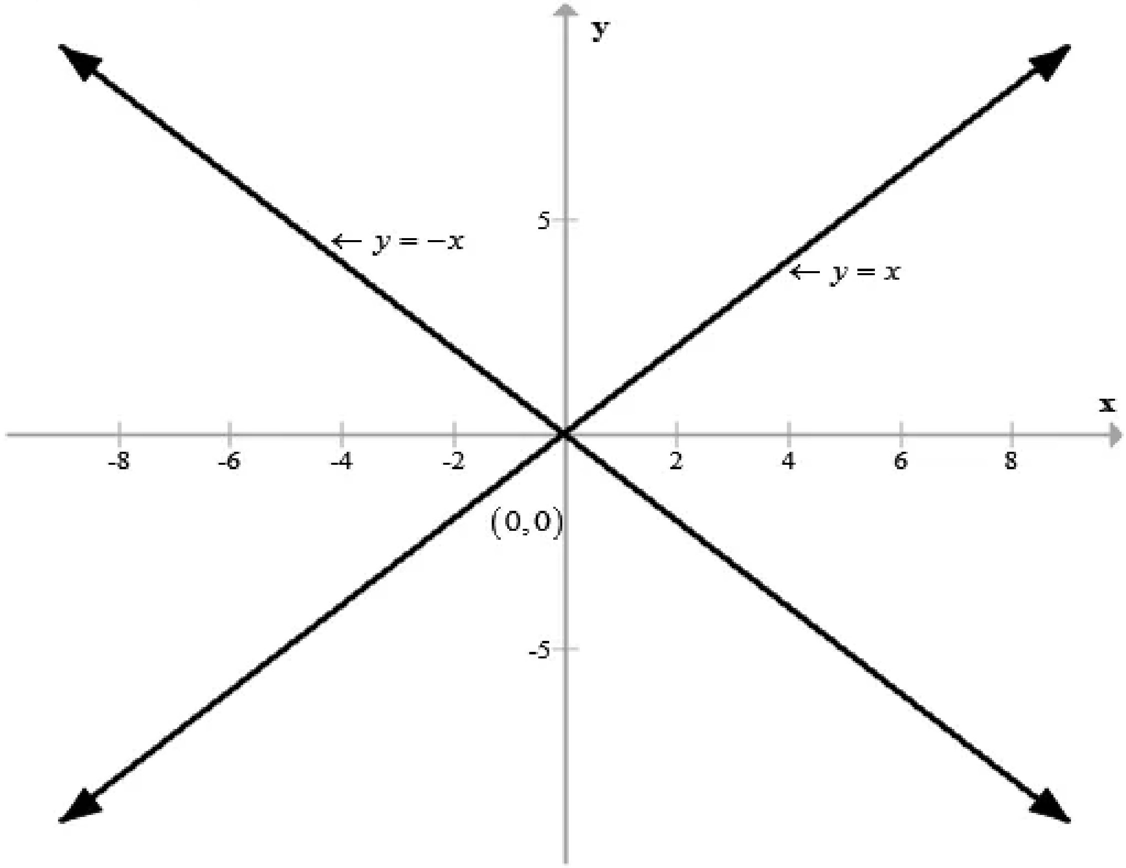
$$y = x$$

$$y = 1 \cdot x + 0$$

$$m = 1, b = 0 \qquad \text{...... (3)}$$

The graph of (3) is a line with the slope 1 and y-intercept 0.

The graph of the equation $y = -x$ and $y = x$ are given below:



Therefore the graphs of $y = -x$ and $y = x$ have a y-intercept of 0, but the graph of $y = -x$ has a slope of -1 instead of 1.

Answer 4gp.

The given equation is

$$y = -x + 2$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$$y = -x + 2$$

$$f(x) = (-1)x + 2 \qquad \text{...... (2)}$$

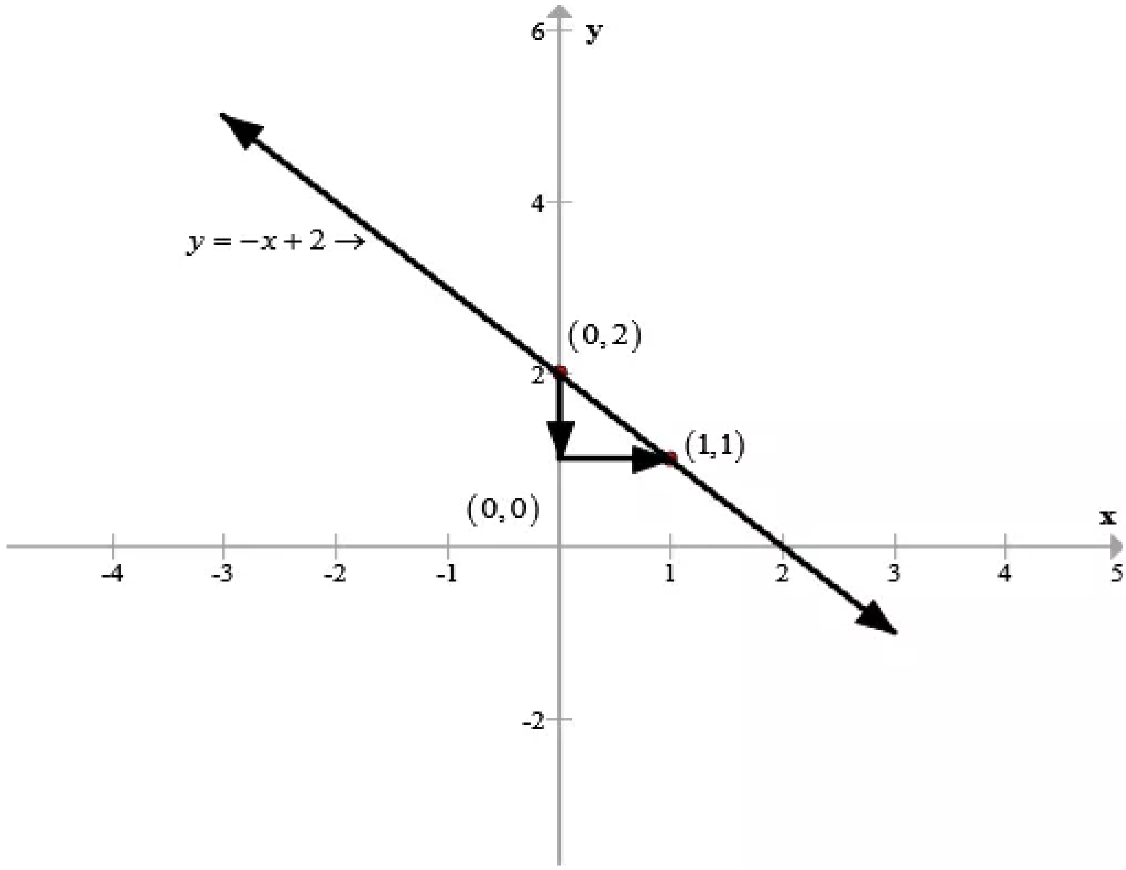
Comparing the equation (2) with the equation (1), we have

$$m = -1, b = 2$$

Therefore the y-intercept is 1, so the point is $(0,2)$.

Again the slope is $\frac{-1}{1}$. So, we plot a second point on the line by starting at $(0,2)$ and then moving down 1 unit and right 1 unit. The second point is $(1,1)$.

Now, we draw a line through the two points $(0,2)$ and $(1,1)$ as follows:



Answer 4q.

The given lines are

Line 1: through $(-3,-7)$ and $(1,9)$

Line 2: through $(-1,-4)$ and $(0,-2)$

Here we need to say that the lines are parallel, perpendicular, or neither.

The slope intercept of the equation of a line is

$$y = mx + b \qquad \ldots\ldots (1)$$

where m be the slope of the line and b be the y-intercept.

For Line 1, putting the point $(-3,-7)$ in the equation (1), we get

$$y = mx + b$$
$$-7 = m\cdot(-3) + b$$
$$-7 = -3m + b \qquad \ldots\ldots (2)$$

Again, we putting the point $(1,9)$ in the equation (1), we get

$$y = mx + b$$
$$9 = m\cdot 1 + b$$
$$9 = m + b \qquad \ldots\ldots (3)$$

Subtracting the equation (2) from (3), we have

$$9 + 7 = m + b + 3m - b$$
$$16 = 4m$$
$$m = 4$$

Therefore the equation of the line passing through the points $(-3,-7)\,(1,9)$ is $\boxed{y = 4x}$

For Line 2, putting the point $(-1,-4)$ in the equation (1), we get

$$y = mx + b$$
$$-4 = m\cdot(-1) + b$$
$$-4 = -m + b \qquad \ldots\ldots (2)$$

Again, we putting the point $(0,-2)$ in the equation (1), we get

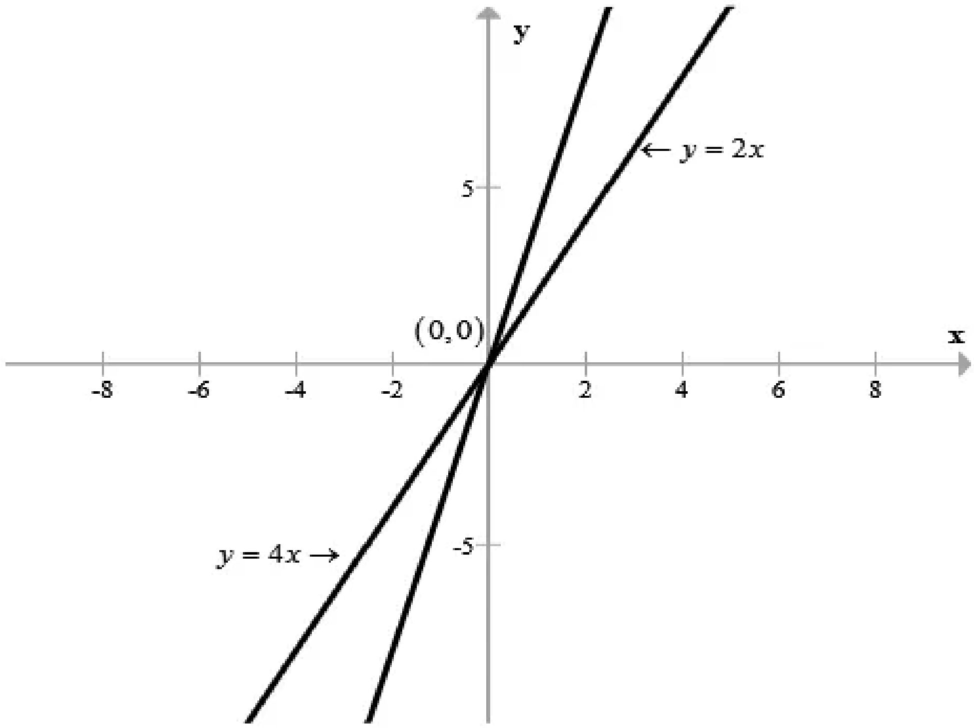
$$y = mx + b$$
$$-2 = m\cdot 0 + b$$
$$-2 = b \qquad \ldots\ldots (3)$$

Subtracting the equation (2) from (3), we have

$$-2 + 4 = b + m - b$$
$$2 = m$$

Therefore the equation of the line passing through the points $(-1,-4)\,(0,-2)$ is $\boxed{y = 2x}$

Therefore the graph of the lines ,Line 1: through $(-3,-7)$ and $(1,9)$ and
Line 2: through $(-1,-4)$ and $(0,-2)$ are parallel, perpendicular, or not we shown below:



From the graph Line1: through $(-3,-7)$ and $(1,9)$ and Line 2: through $(-1,-4)$ and $(0,-2)$ are neither parallel nor perpendicular.

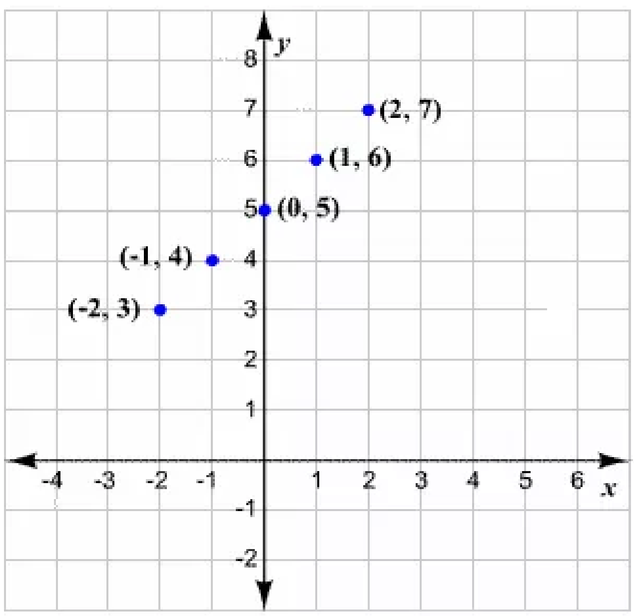
Answer 5e.

We need to find some points that satisfy the equation. For this, choose some values for x and evaluate the corresponding values of y.

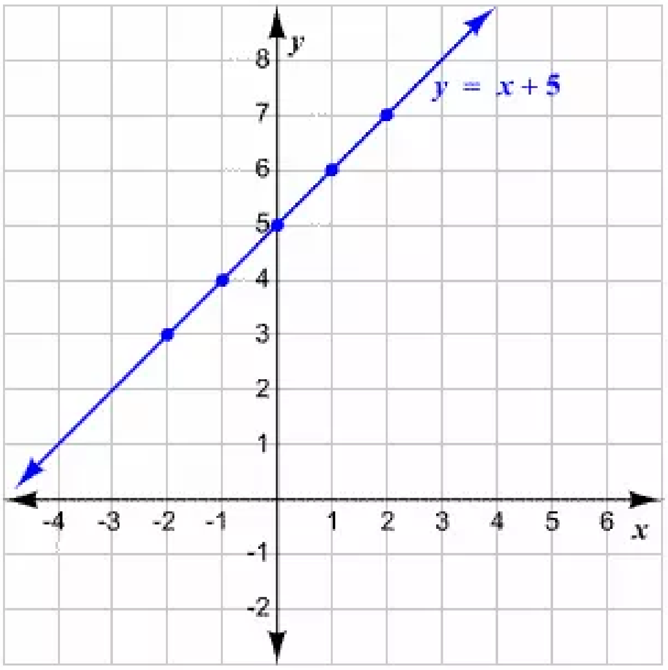
x	-2	-1	0	1	2
$y = x + 5$	3	4	5	6	7

The points are (–2, 3), (–1, 4), (0, 5), (1, 6), and (2, 7).

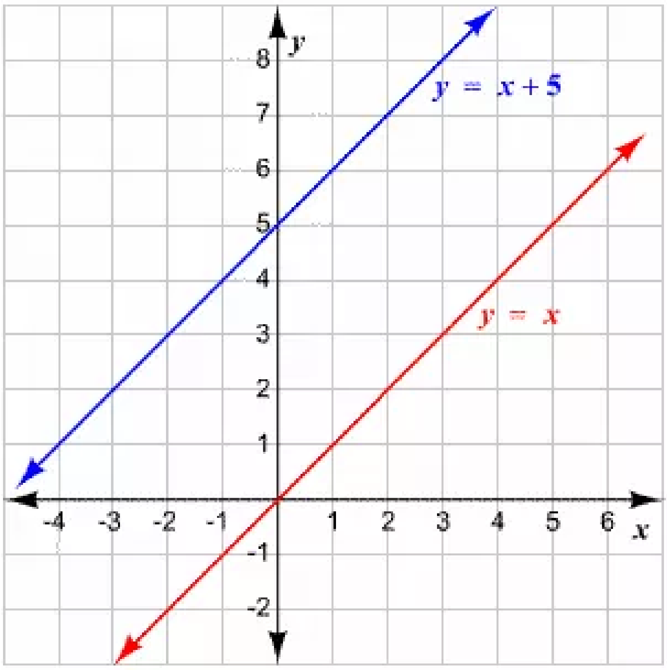
Plot the points on a coordinate plane.



Connect the points with a straight line.



Similarly, graph the equation $y = x$ on the same coordinate plane.



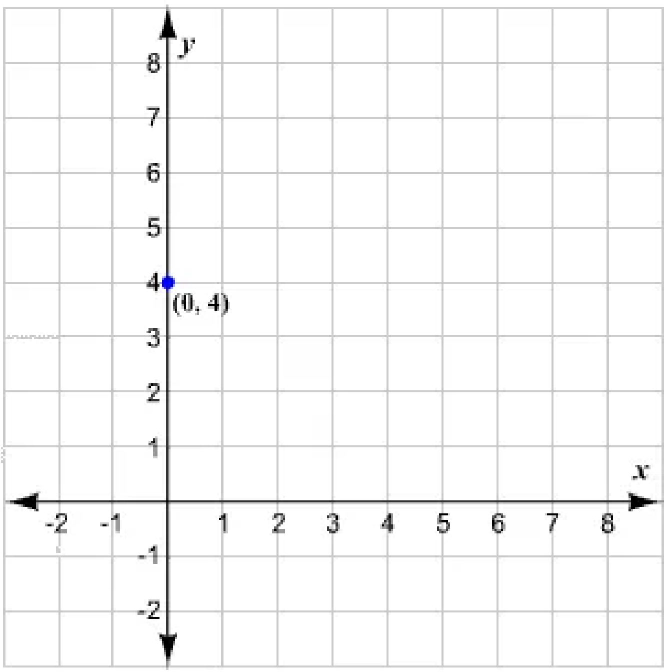
On comparing, we can see that both the graphs have a slope of 1, but the graph of $y = x + 5$ has a y-intercept of 5 instead of 0.

Answer 5gp.

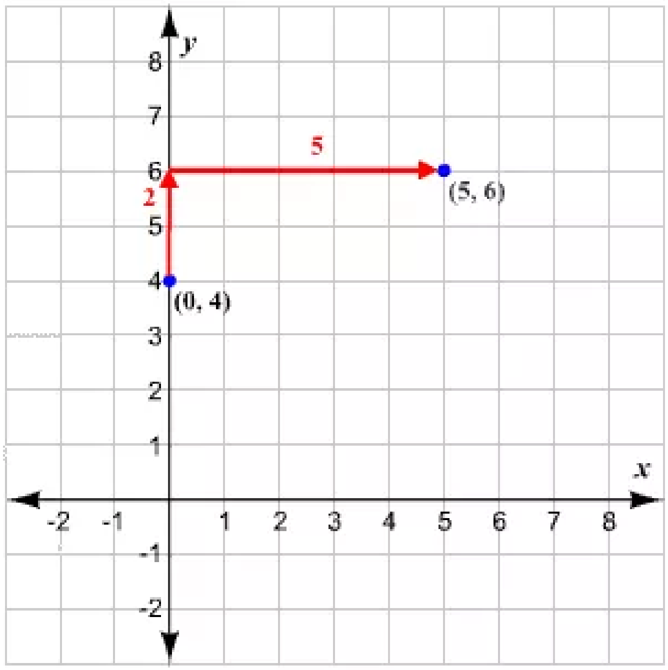
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is $\frac{2}{5}$, and b is 4.

STEP 2 The y-intercept is 4. Plot the point (0, 4) on a coordinate plane where the line crosses the y-axis.

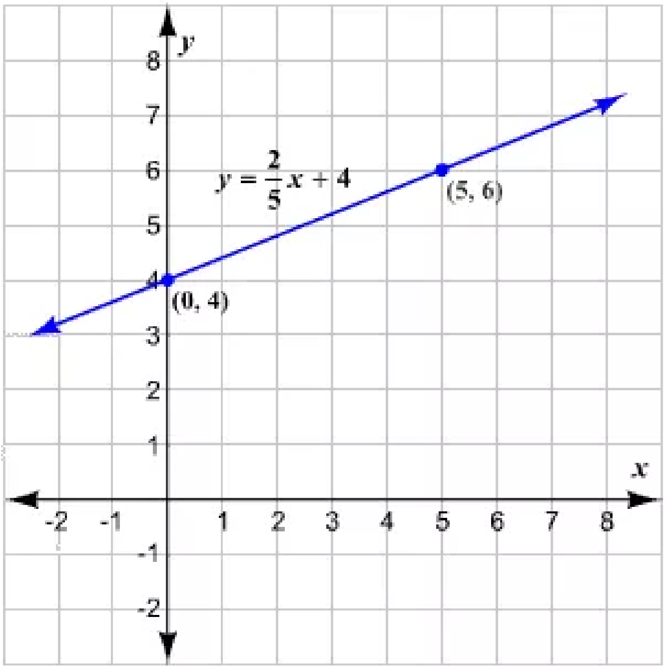


STEP 3 Use the slope to plot a second point on the line. Since the slope is $\frac{2}{5}$, start at (0, 4) and then move 2 units up. Now, move 5 units to the right.



The second point is (5, 6).

STEP 4 Finally, draw a line through the two points.



Answer 5q.

We know that the general form of an absolute value function is $y = a|x - h| + k$, where (h, k) is the vertex of the function.

From the given graph, we note that the vertex is (5, 1). Thus, the value of h is 5 and of k is 1.

Substitute 5 for h, and 1 for k in the general form.

$y = a|x - 5| + 1$

One of the coordinates (2, 4) is given. Substitute 2 for x, and 4 for y in the equation.

$$4 = a|2 - 5| + 1$$

$$4 = 3a + 1$$

Subtract 1 from both sides of the equation.

$$4 - 1 = 3a + 1 - 1$$

$$3 = 3a$$

Divide both the sides by 3.

$$\frac{3}{3} = \frac{3}{3}a$$

$$1 = a$$

Therefore, the required equation of the given graph is $y = |x - 5| + 1$.

Answer 6e.

We need to compare the graph of the given equation $y = x - 2$ with the graph of the equation $y = x$.

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (2), we have

$$y = x - 2$$

$$y = 1 \cdot x + (-2) \qquad \text{...... (2)}$$

Comparing the equation (2) with the equation (1), we have

$$m = 1, b = -2$$

The graph of (2) is a line with the slope 1 and y-intercept 2.

Comparing the equation $y = x$ with the equation (1), we have

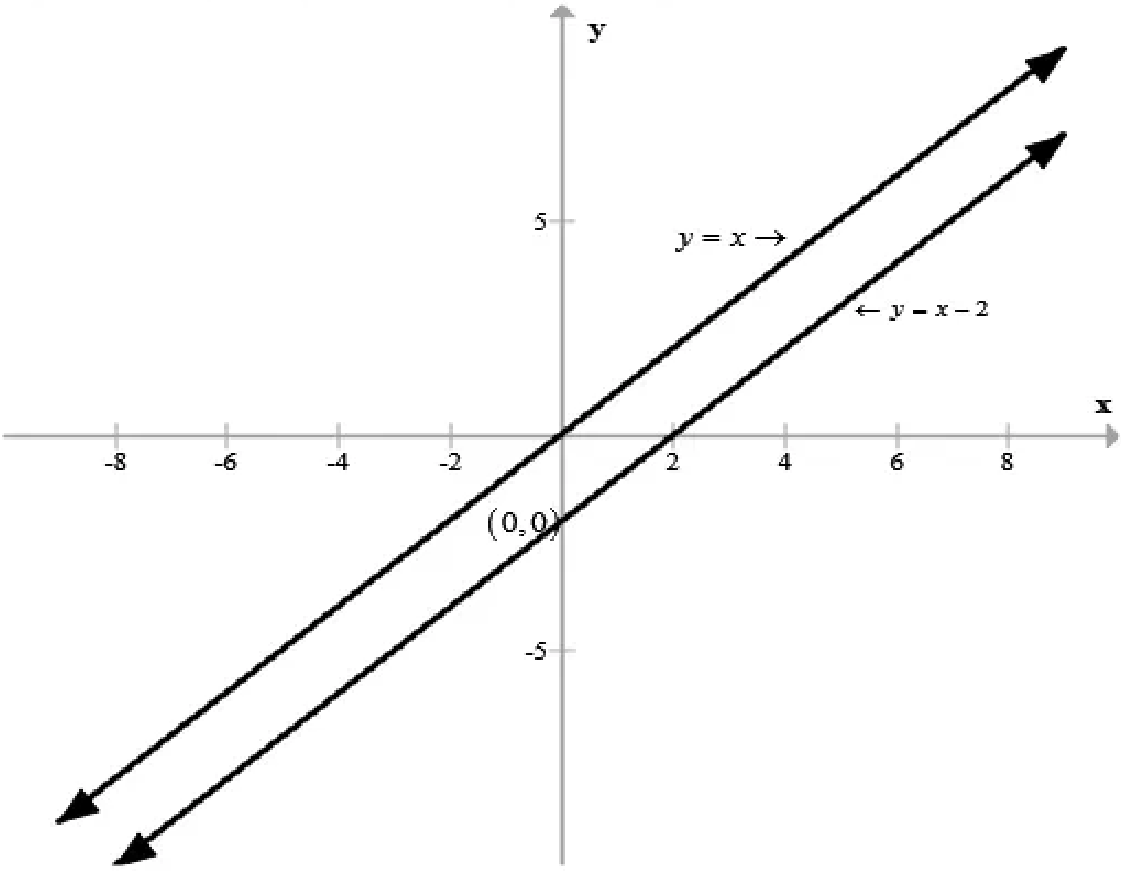
$$y = x$$

$$y = 1 \cdot x + 0$$

$$m = 1, b = 0 \qquad \text{...... (3)}$$

The graph of (3) is a line with the slope 1 and y-intercept 0.

The graph of the equation $y = x - 2$ and $y = x$ are given below:



Therefore the graphs of $y = x - 2$ and $y = x$ both have a slope of 1, but the graph of $y = x - 2$ has a y-intercept of -2 instead of 0.

Answer 6gp.

The given equation is

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

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

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

$$f(x) = \frac{1}{2}x + (-3) \qquad \text{...... (2)}$$

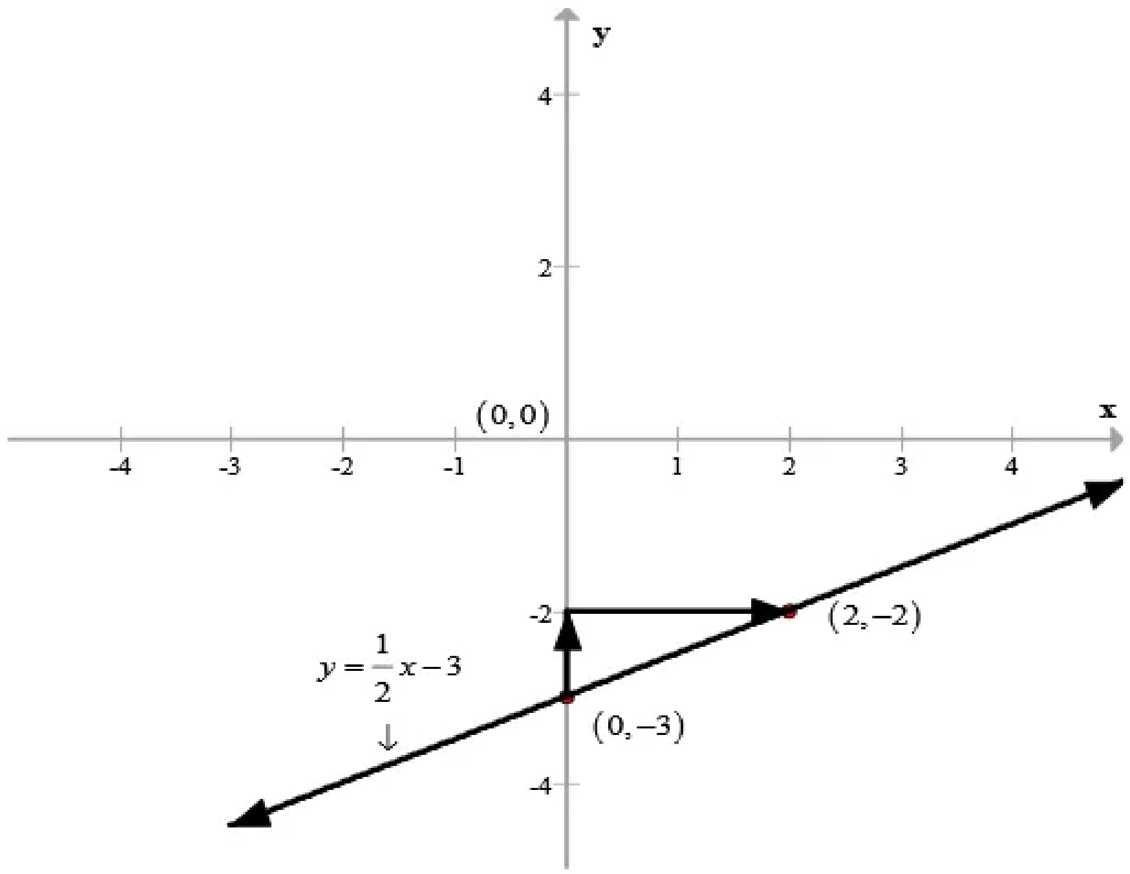
Comparing the equation (2) with the equation (1), we have

$$m = \frac{1}{2}, b = -3$$

Therefore the y-intercept is 1, so the point is $(0, -3)$.

Again the slope is $\frac{1}{2}$. So, we plot a second point on the line by starting at $(0, -3)$ and then moving up 1 unit and right 2 units. The second point is $(2, -2)$.

Now, we draw a line through the two points $(0, -3)$ and $(2, -2)$ as follows:



Answer 6q.

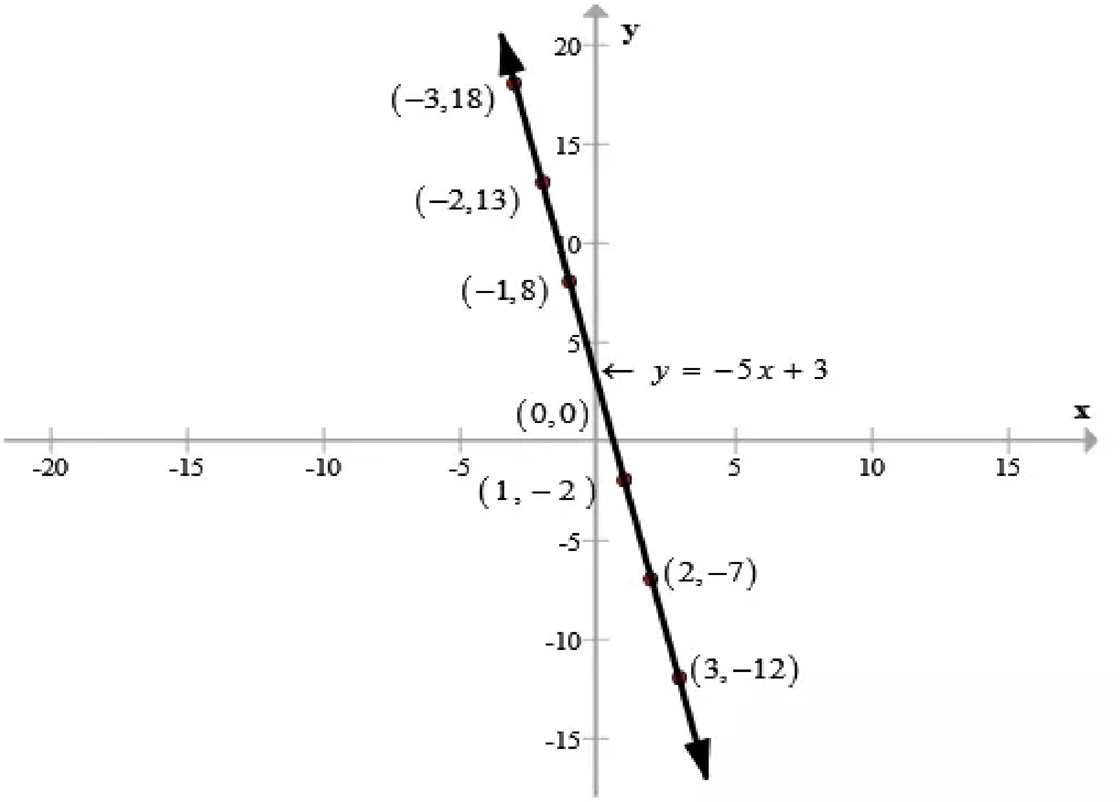
Given equation is

$$y = -5x + 3 \qquad \ldots\ldots (1)$$

Suppose, we put $x = -1, -2, -3, 1, 2, 3$ in equation (1), we have

$$y = 8, 13, 18, -2, -7, -12$$

The graph of the equation $y = -5x + 3$ is shown below:



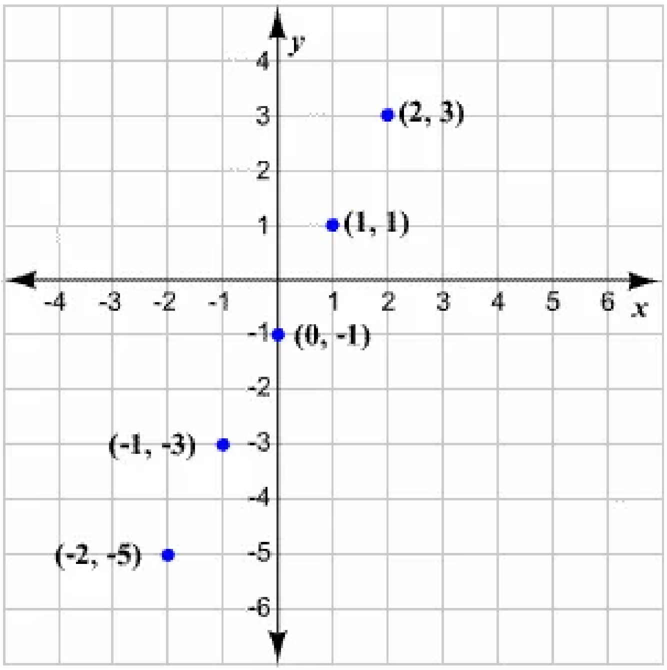
Answer 7e.

We need to find some points that satisfy the equation. For this, choose some values for x and evaluate the corresponding values of y.

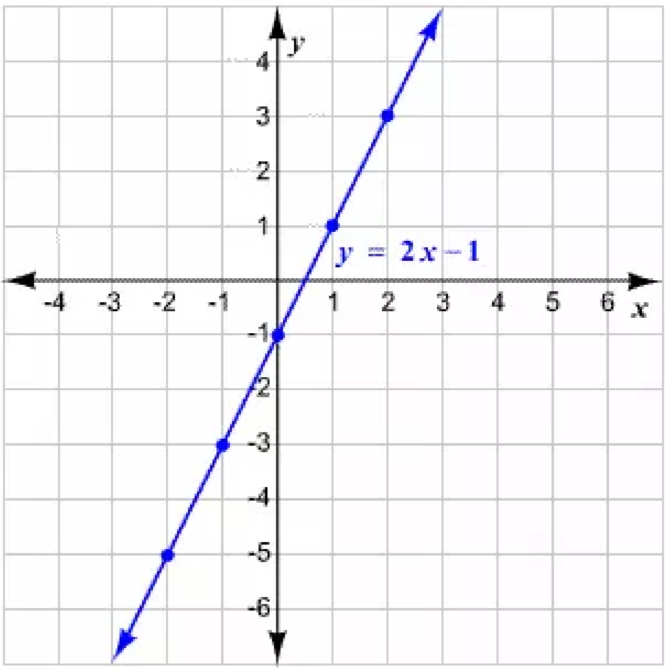
x	-2	-1	0	1	2
$y = 2x - 1$	-5	-3	-1	1	3

The points are $(-2, -5)$, $(-1, -3)$, $(0, -1)$, $(1, 1)$, and $(2, 3)$.

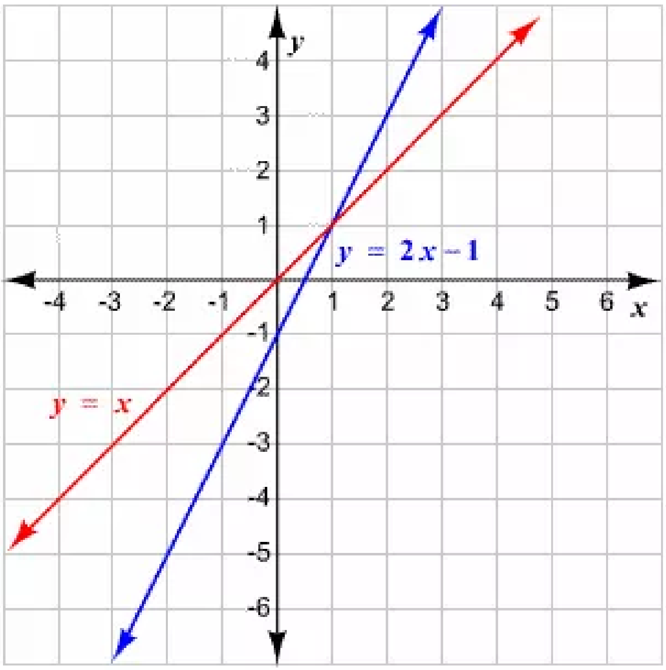
Plot the points on a coordinate plane.



Connect the points with a straight line.



Similarly, graph the equation $y = x$ on the same coordinate plane.



On comparing, we can see that the graph of $y = 2x - 1$ has a slope of 2 and the graph of $y = x$ has a slope of 1. The graph of $y = 2x - 1$ has a slope of 2 and the graph of $y = x$ has a slope of 1.

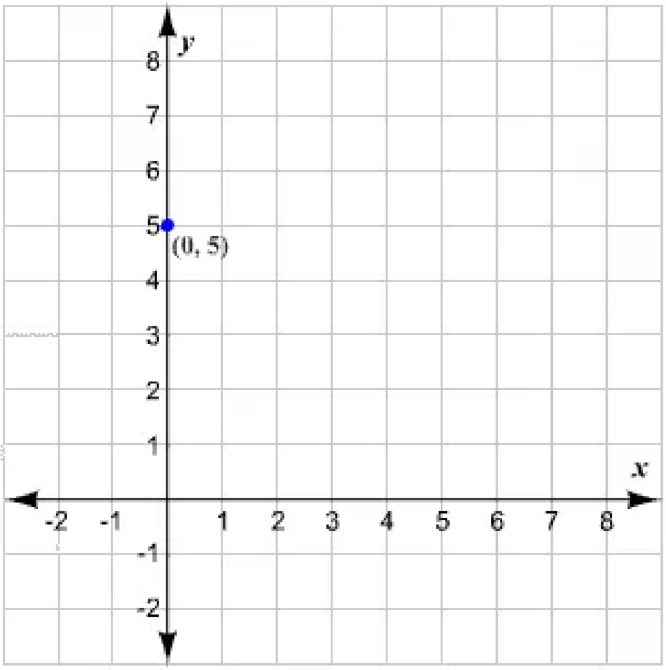
Answer 7gp.

STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. Rewrite the given equation.

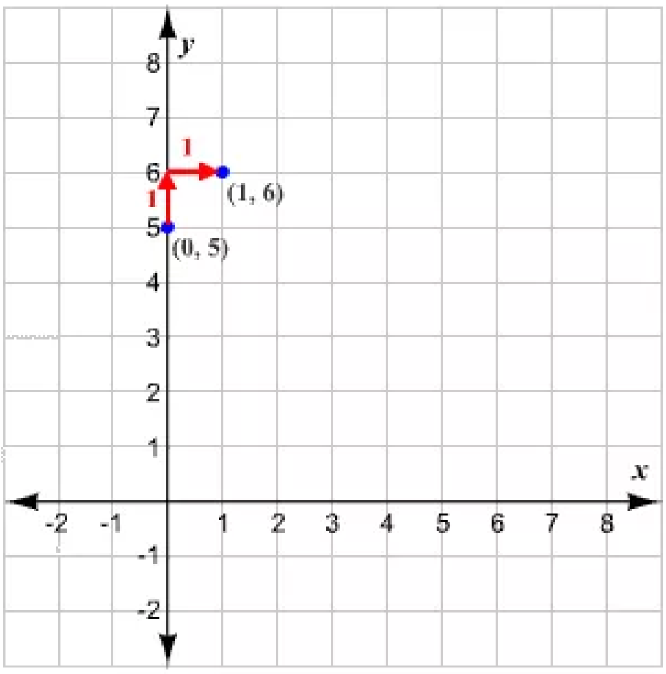
$y = x + 5$

On comparing the given equation with $y = mx + b$, we find that m is 1, and b is 5.

STEP 2 The y-intercept is 5. Plot the point (0, 5) on a coordinate plane where the line crosses the y-axis.

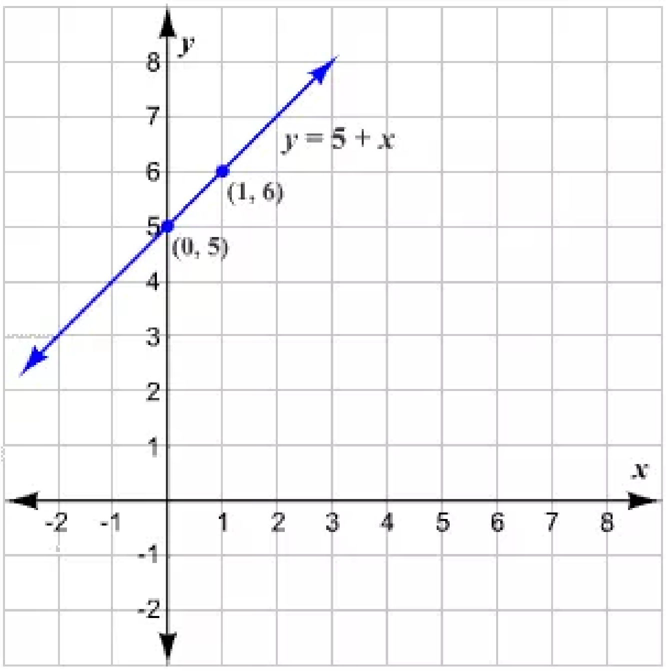


STEP 3 Use the slope to plot a second point on the line. Since the slope is 1 or $\frac{1}{1}$, start at (0, 5) and then move 1 unit up. Now, move 1 unit to the right.



The second point is (1, 6).

STEP 4 Finally, draw a line through the two points.



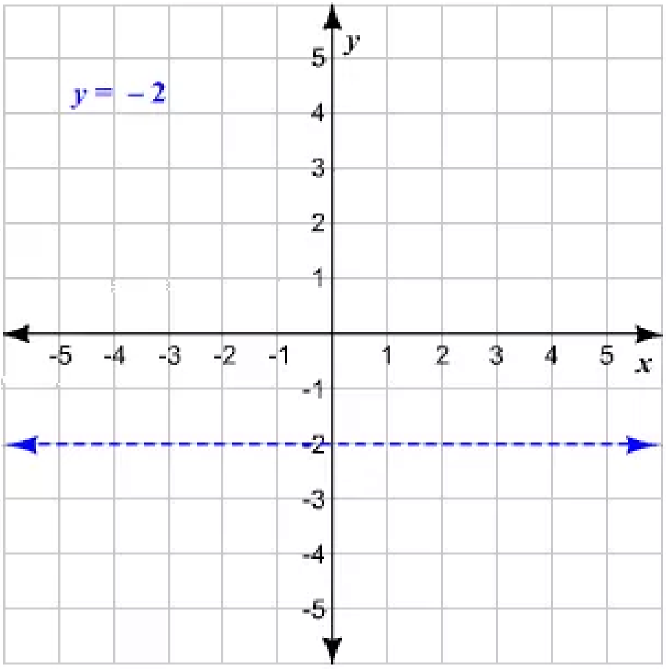
Answer 7q.

STEP 1 **Graph the boundary line of the inequality.**

In order to obtain the boundary line, replace the inequality sign with = sign. Then, we get an equation of the form $y = c$ which is the equation of a horizontal line passing through $(0, c)$.

In this case, the value of c is -2. This means that $y = -2$ passes through $(0, -2)$.

Graph the boundary line $y = -2$. Since > is the inequality sign used, draw a dashed line.

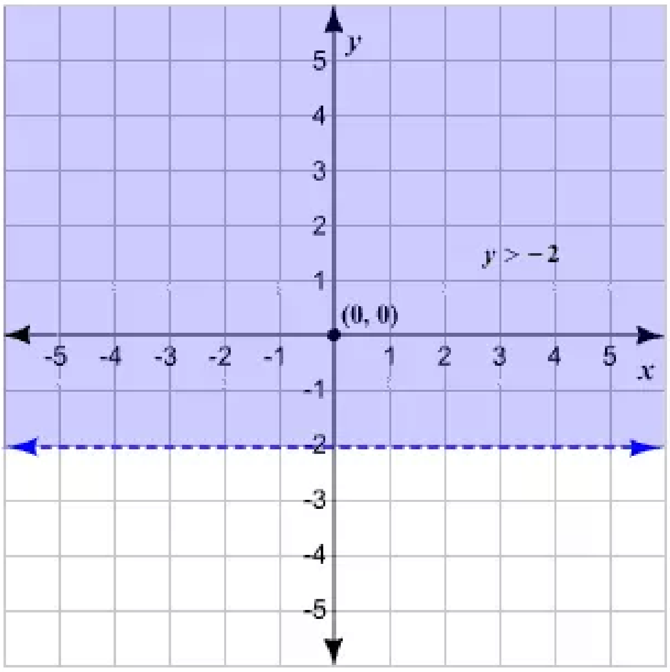


STEP 2 **Test a point.**

Let us take a test point (0, 0) which does not lie on the boundary line.
Substitute 0 for y and check if the test point satisfies the given inequality.

$0 > -2$ TRUE

The test point is a solution of the inequality. Shade the half-plane that contains (0, 0).



Answer 8e.

We need to compare the graph of the given equation $y=-3x+2$ with the graph of the equation $y=x$.

The slope intercept of the equation of a line is

$$y=mx+b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (2), we have

$$y=-3x+2$$

$$y=(-3)\cdot x+2 \qquad \text{...... (2)}$$

Comparing the equation (2) with the equation (1), we have

$$m=-3, b=2$$

The graph of (2) is a line with the slope -3 and y-intercept 2.

Comparing the equation $y=x$ with the equation (1), we have

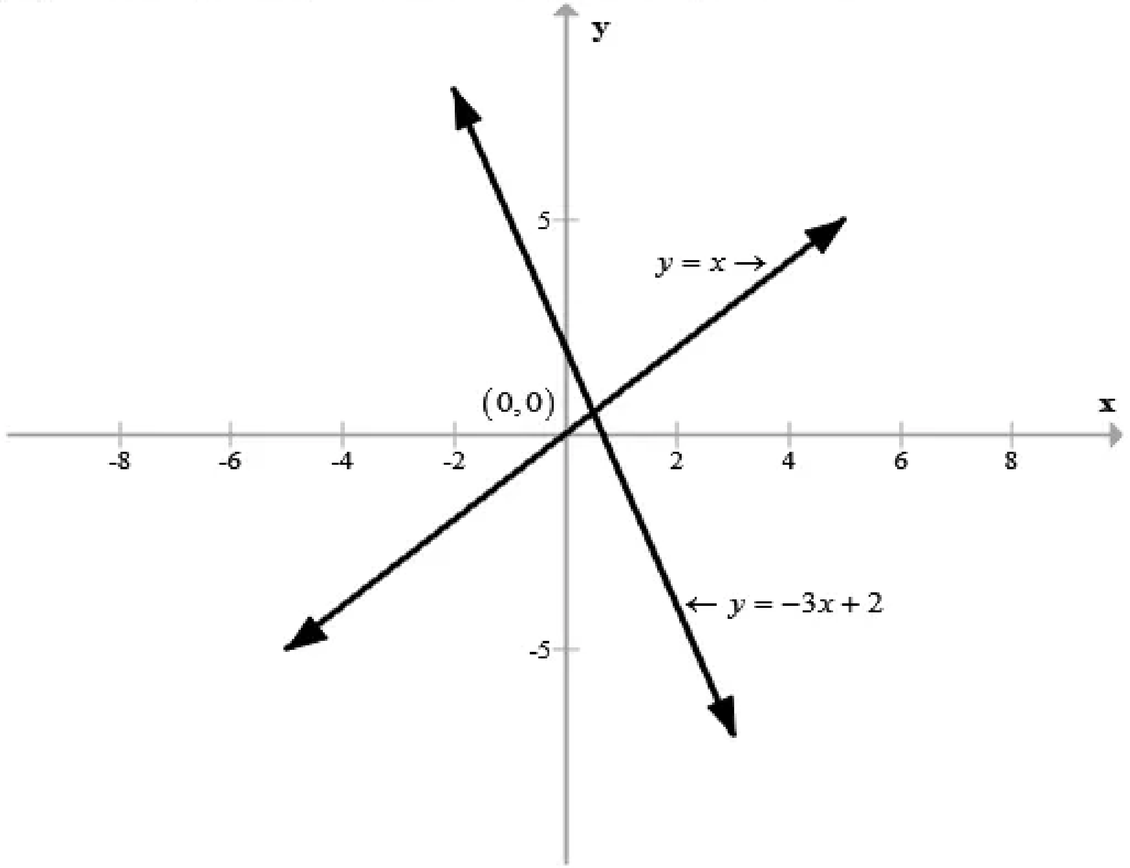
$$y=x$$

$$y=1\cdot x+0$$

$$m=1, b=0 \qquad \text{...... (3)}$$

The graph of (3) is a line with the slope 1 and y-intercept 0.

The graph of the equation $y=-3x+2$ and $y=x$ are given below:



Therefore the graphs of $y=-3x+2$ and $y=x$ have the slope of -3 and 1, but the graph of $y=-3x+2$ has a y-intercept of 2 instead of 0.

Answer 8gp.

The given equation is

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

The slope intercept of the equation of a line is

$$y=mx+b \quad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

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

$$f(x)=(-3)x+1 \quad \text{...... (2)}$$

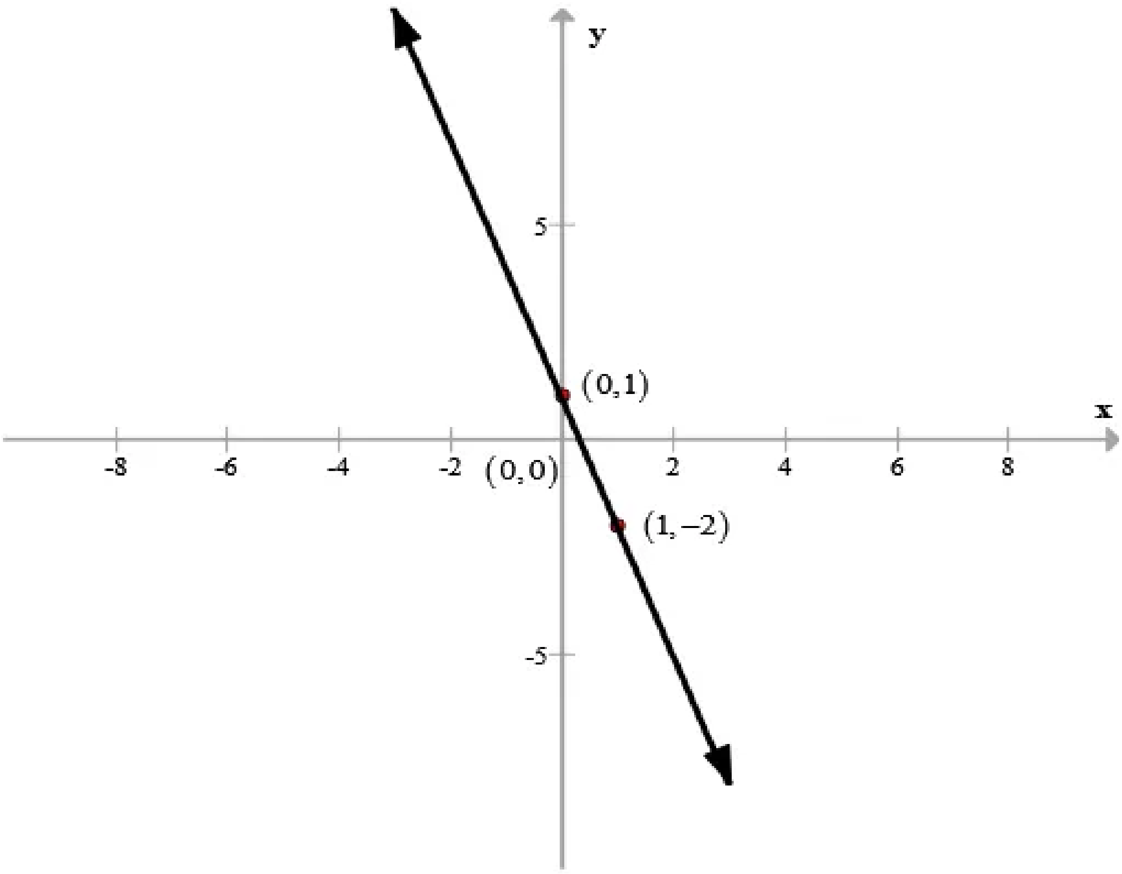
Comparing the equation (2) with the equation (1), we have

$$m=-3, b=1$$

Therefore the y-intercept is 1, so the point is $(0,1)$.

Again the slope is $\frac{-3}{1}$. So, we plot a second point on the line by starting at $(0,1)$ and then moving down 3 units and right 1 unit. The second point is $(1,-2)$.

Now, we draw a line through the two point $(0,1)$ and $(1,-2)$ as follows:



Answer 8q.

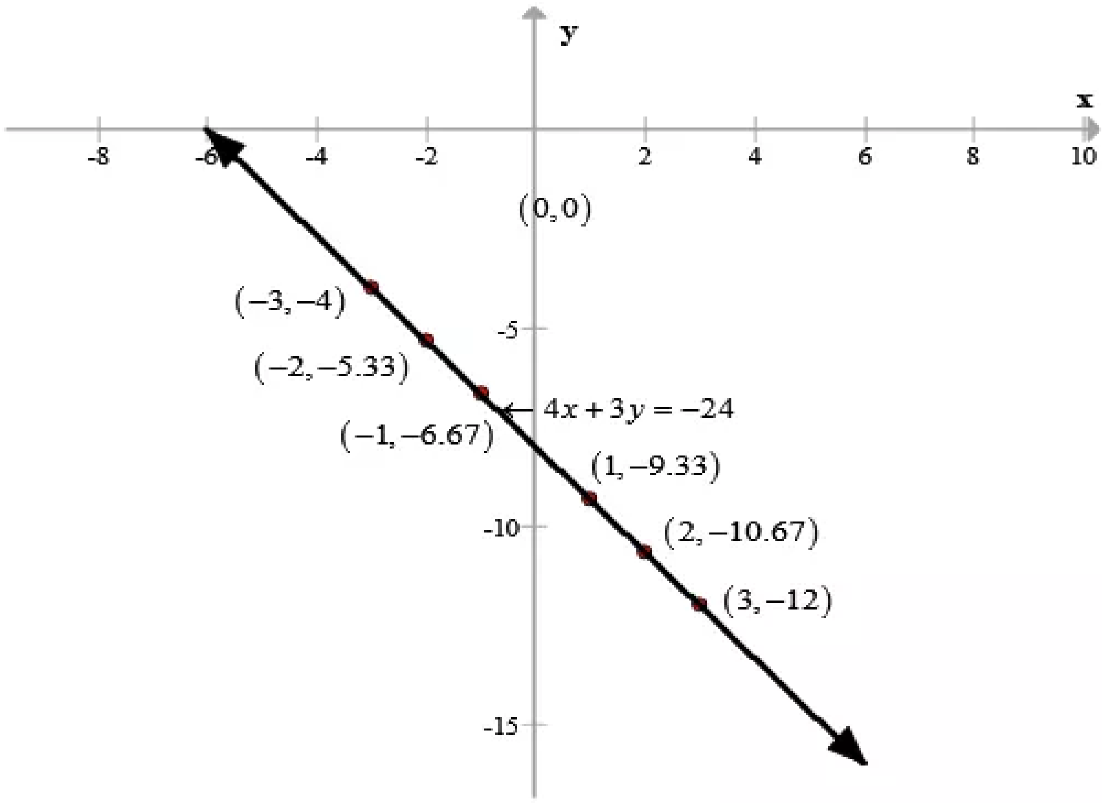
Given equation is

$$4x+3y=-24 \quad \text{...... (1)}$$

Suppose, we put $x=-1,-2,-3,1,2,3$ in equation (1), we have

$$y=-6.67,-5.33,-4,-9.33,-10.67,-12$$

The graph of the equation $4x+3y=-24$ is shown below:

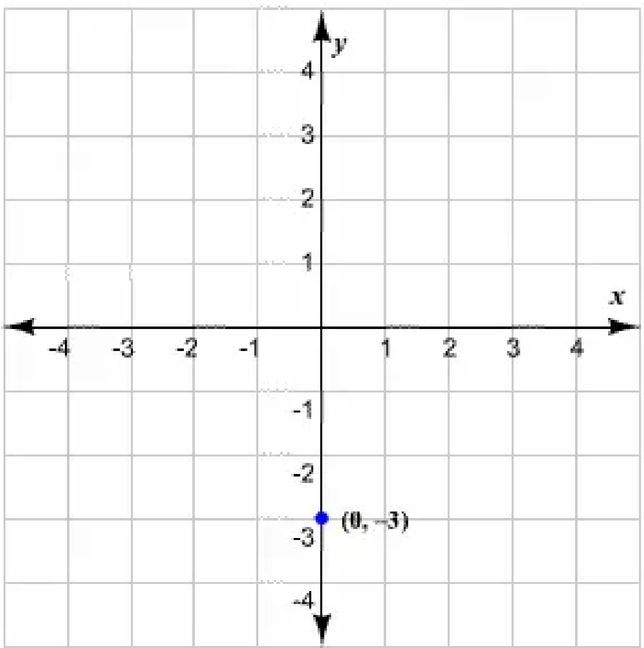


Answer 9e.

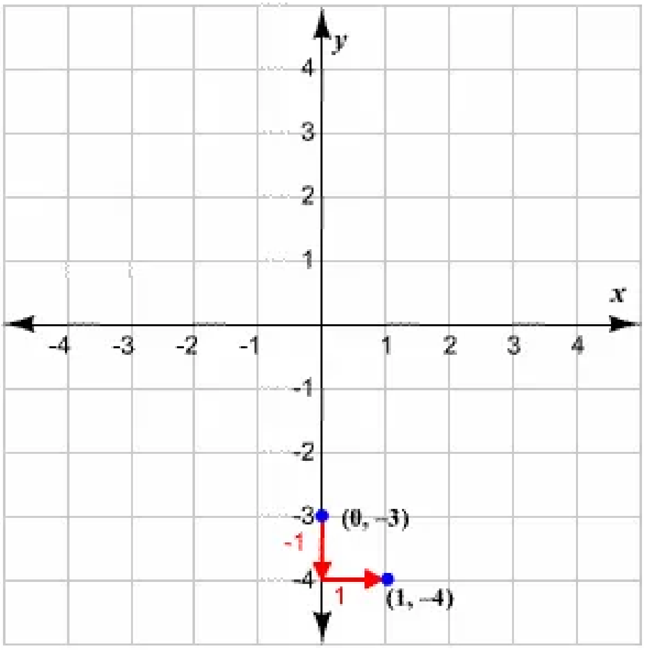
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is -1, and b is -3.

STEP 2 The y-intercept is -3. Plot the point $(0, -3)$ on a coordinate plane where the line crosses the y-axis.

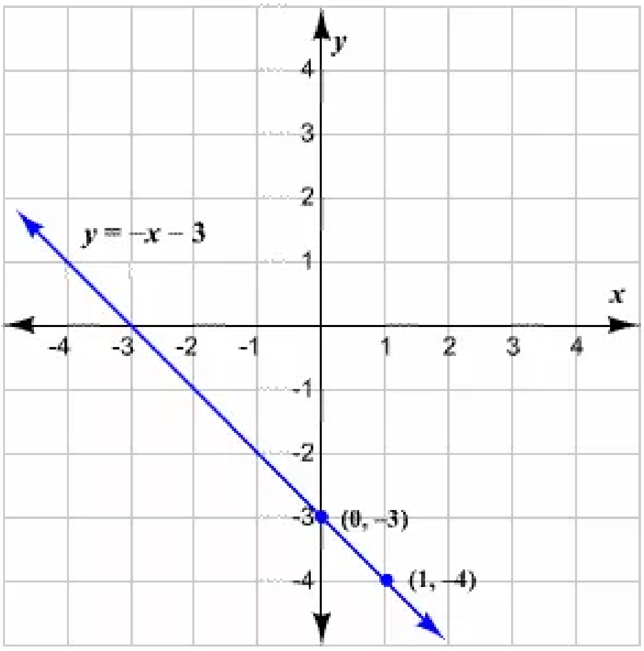


STEP 3 Use the slope to plot a second point on the line. Since the slope is -1, or $\frac{-1}{1}$, start at $(0, -3)$ and then move 1 unit down. Now, move 1 unit to the right.



The second point is $(1, -4)$.

STEP 4 Finally, draw a line through the two points.



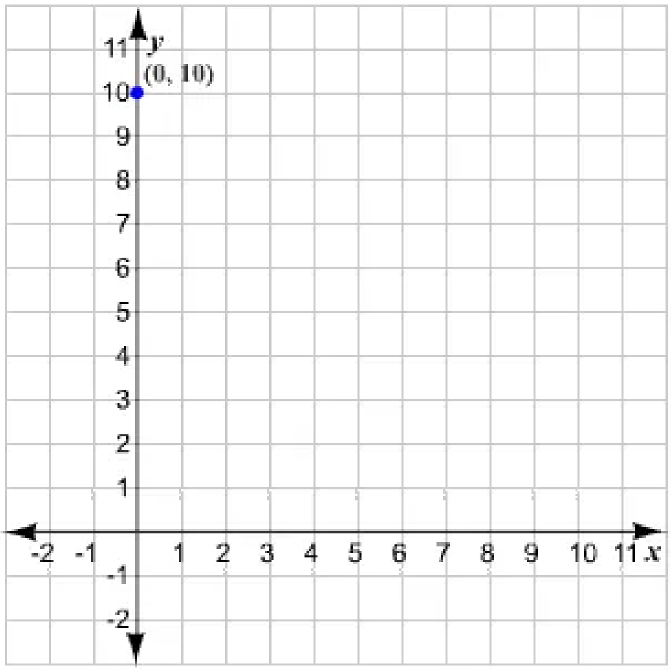
Answer 9gp.

STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. Rewrite the given equation.

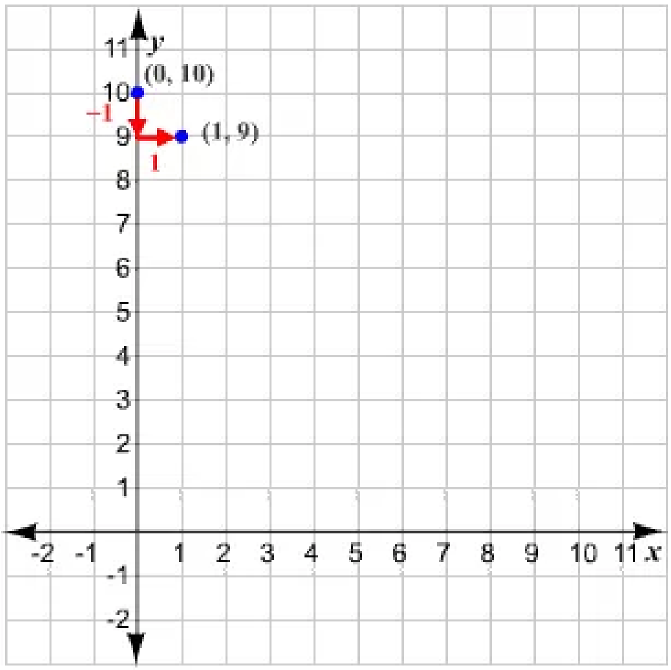
$f(x) = -x + 10$

On comparing the given equation with $y = mx + b$, we find that m is -1, and b is 10.

STEP 2 The y-intercept is 10. Plot the point (0, 10) on a coordinate plane where the line crosses the y-axis.

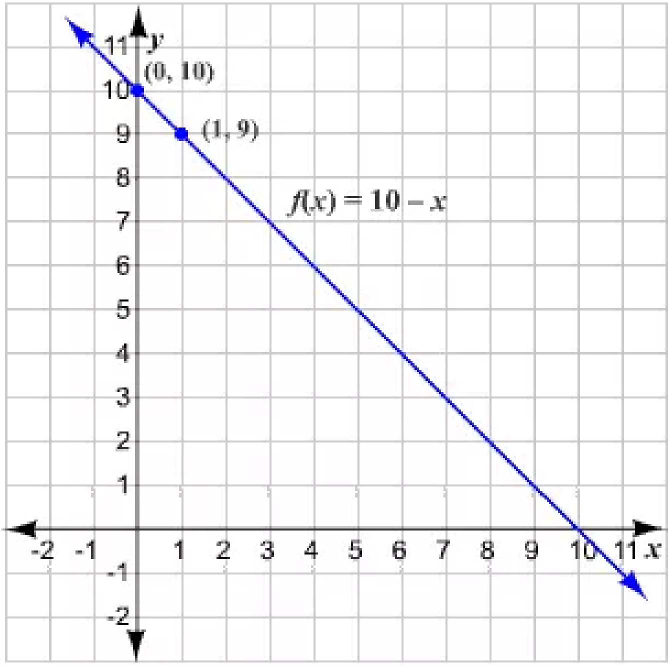


STEP 3 Use the slope to plot a second point on the line. Since the slope is −1 or $\frac{-1}{1}$, start at (0, 10) and then move 1 unit down. Now, move 1 unit to the right.



The second point is (1, 9).

STEP 4 Finally, draw a line through the two points.



Answer 9q.

STEP 1 **Graph the boundary line of the inequality.**

In order to obtain the boundary line, replace the inequality sign with "=". Then, we get an equation of the form $2x - 5y = 10$.

Substitute 0 for y in above equation and solve for x to find the x-intercept.

$$2x - 5(0) = 10$$
$$2x = 10$$
$$x = 5$$

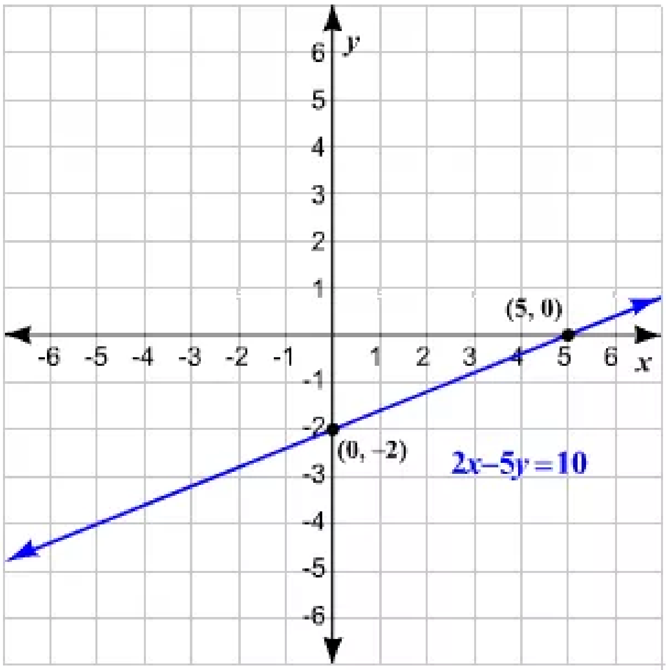
The x-intercept is 5. A point that can be plotted on the graph is (5, 0).

Next, replace x with 0 and solve for y to find the y-intercept.

$$2(0) - 5y = 10$$
$$-5y = 10$$
$$y = -2$$

Since the y-intercept is –2, another point that can be plotted on the graph is (0, –2).

Plot the points (5, 0), and (0, −2) on the graph and draw a line passing through them. Since ≥ is the inequality sign used, draw a solid line.



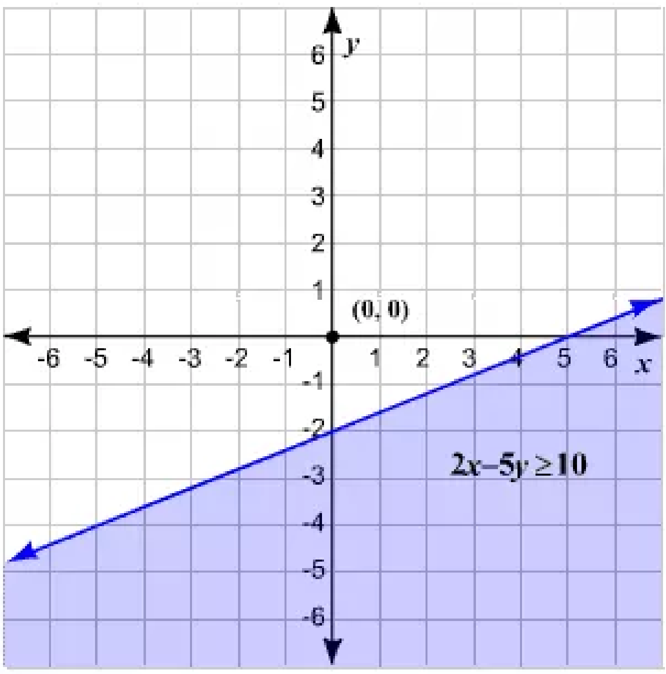
STEP 2 **Test a point.**

Let us take a test point (0, 0) which does not lie on the boundary line. Substitute 0 for *y*, and 0 for *x*. Check if the test point satisfies the given inequality.

$$2(0) - 5(0) \overset{?}{\geq} 10$$

$$0 \geq 10 \qquad \text{FALSE}$$

The test point is not a solution to the inequality. Shade the half-plane that does not contain (0, 0).



Answer 10e.

The given equation is

$$y = x - 6$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$$y = x - 6$$

$$y = x + (-6) \qquad \text{...... (2)}$$

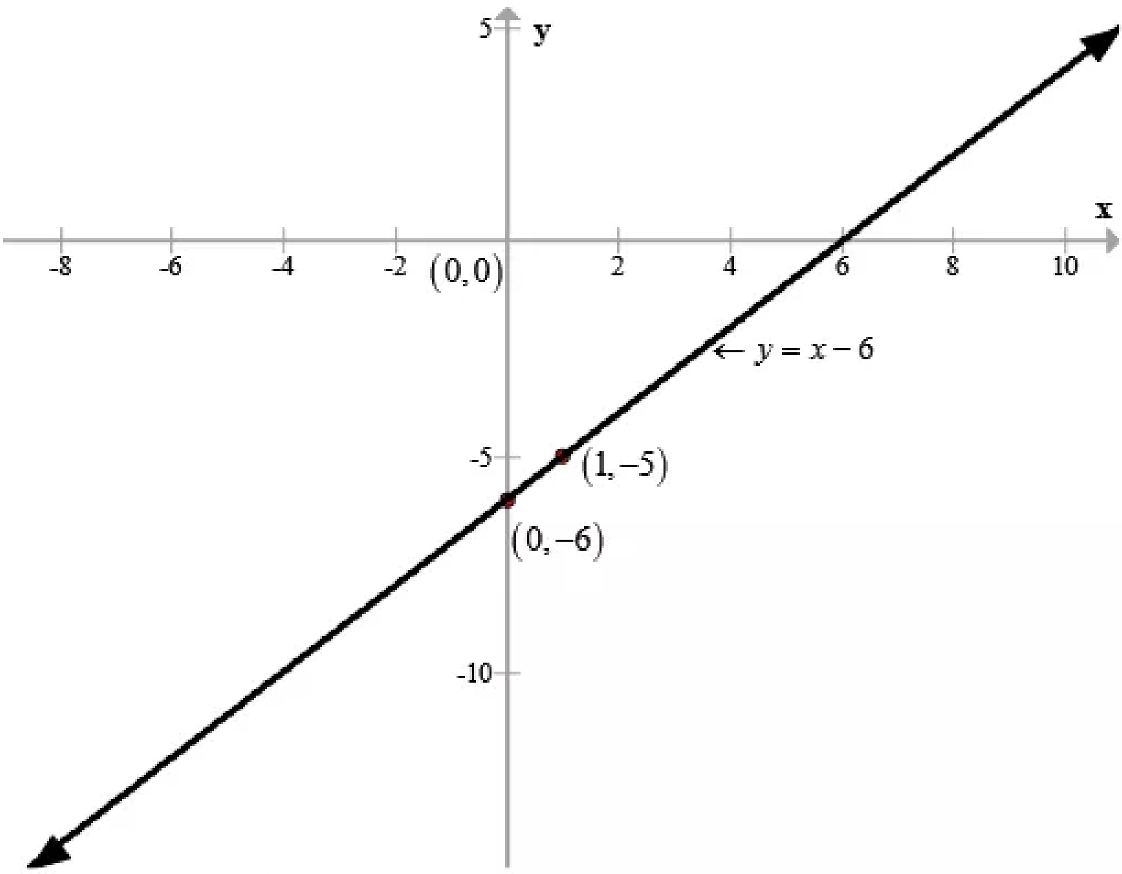
Comparing the equation (2) with the equation (1), we have

$$m = 1, b = -6$$

Therefore the y-intercept is -6, so the point is $(0, -6)$.

Again the slope is $\frac{1}{1}$. So, we plot a second point on the line by starting at $(0, -6)$ and then moving up 1 unit and right 1 unit. The second point is $(1, -5)$.

Now, we draw a line through the two points $(0, -6)$ and $(1, -5)$ as follows:



This is the graph of the equation $y = x - 6$.

Answer 10gp.

Given that the body length of a fast growing calf is modeled by

$$y = 6x + 48$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

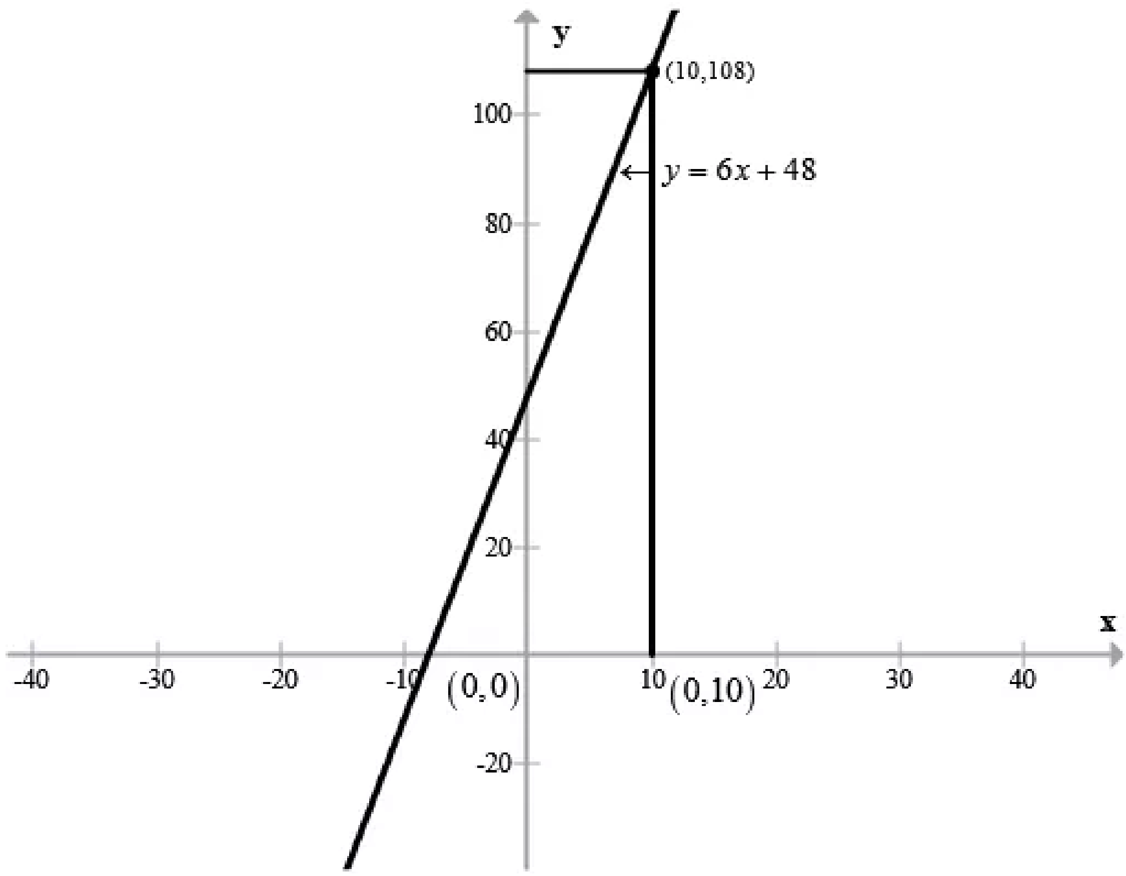
The standard form of equation (1) is

$$y = 6x + 48$$

To interpret the slope of the equation (1) is 6, represent the calf's rate of growth in inches per month. The y-intercept, 48, represents a newborn calf's body length in inches.

Now, to estimate the body length of the calf at age 10 months by starting at 10 on the x-axis and moving up until we reach the graph. Then move left to the y-axis. At age 10 months, the body length of the calf is about 108 inches.

The graph of the equation $y = 6x + 48$ is shown below:

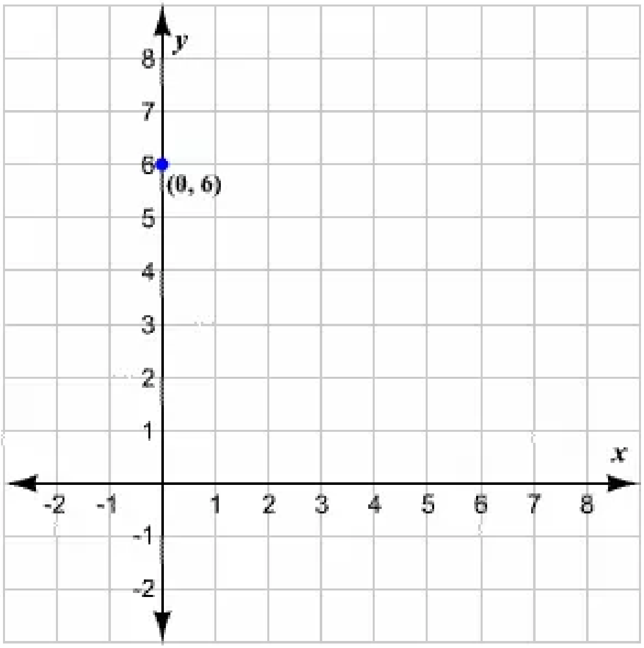


Answer 11e.

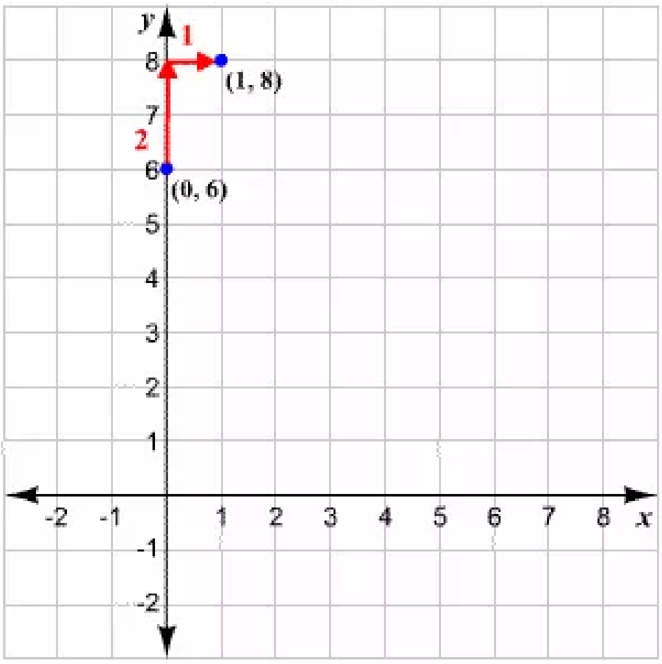
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is 2, and b is 6.

STEP 2 The y-intercept is 6. Plot the point (0, 6) on a coordinate plane where the line crosses the y-axis.

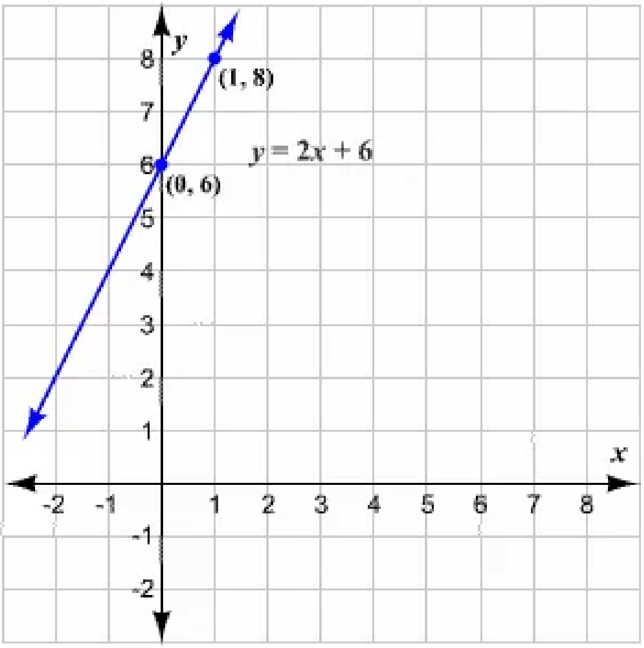


STEP 3 Use the slope to plot a second point on the line. Since the slope is 2, or $\frac{2}{1}$, start at (0, 6) and then move 2 units up. Now, move 1 unit to the right.



The second point is (1, 8).

STEP 4 Finally, draw a line through the two points.



Answer 11gp.

STEP 1 A linear equation of the form $Ax + By = C$, where A and B are not both zero, is said to be in standard form. Thus, the given equation is already in standard form.

STEP 2 Identify the x-intercept.

The x-coordinate of a point where a graph intersects the x-axis is the x-intercept. For finding the x-intercept, first substitute 0 for y in the equation.

$2x + 5(0) = 10$

Next, solve for x.

$$2x + 0 = 10$$

$$2x = 10$$

Divide each side by 2.

$$\frac{2x}{2} = \frac{10}{2}$$

$$x = 5$$

Since the x-intercept is 5, the graph of the given equation crosses the x-axis at (5, 0).

STEP 3 Identify the y-intercept.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept. Substitute 0 for x in the equation to find the y-intercept.

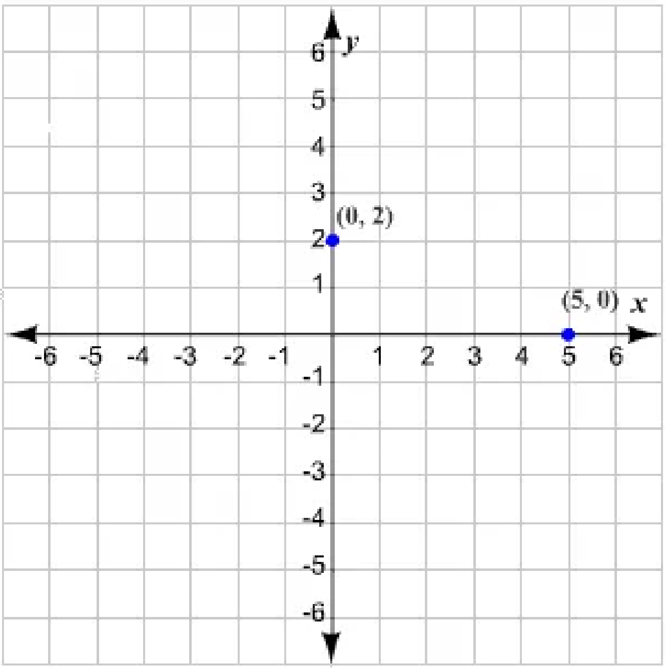
$2(0) + 5y = 10$

Next, solve for y.

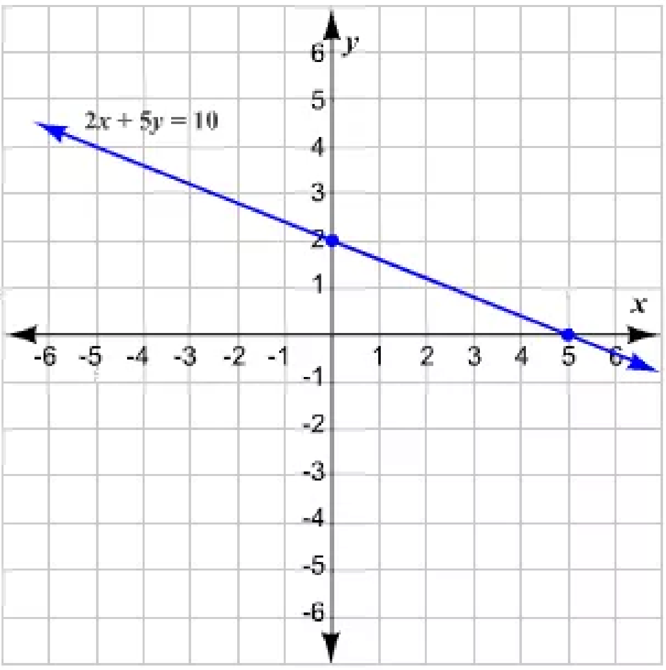
$$5y = 10$$
$$y = 2$$

The y-intercept of the line with the given equation is 2. Thus, the line crosses the y-axis at (0, 2).

STEP 4 For graphing the given equation, first plot the points (5, 0) and (0, 2) on a coordinate plane.



Now, draw a line through the two points.



Answer 12e.

The given equation is

$$y = 3x - 4$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$$y = 3x - 4$$

$$y = 3x + (-4) \qquad \text{...... (2)}$$

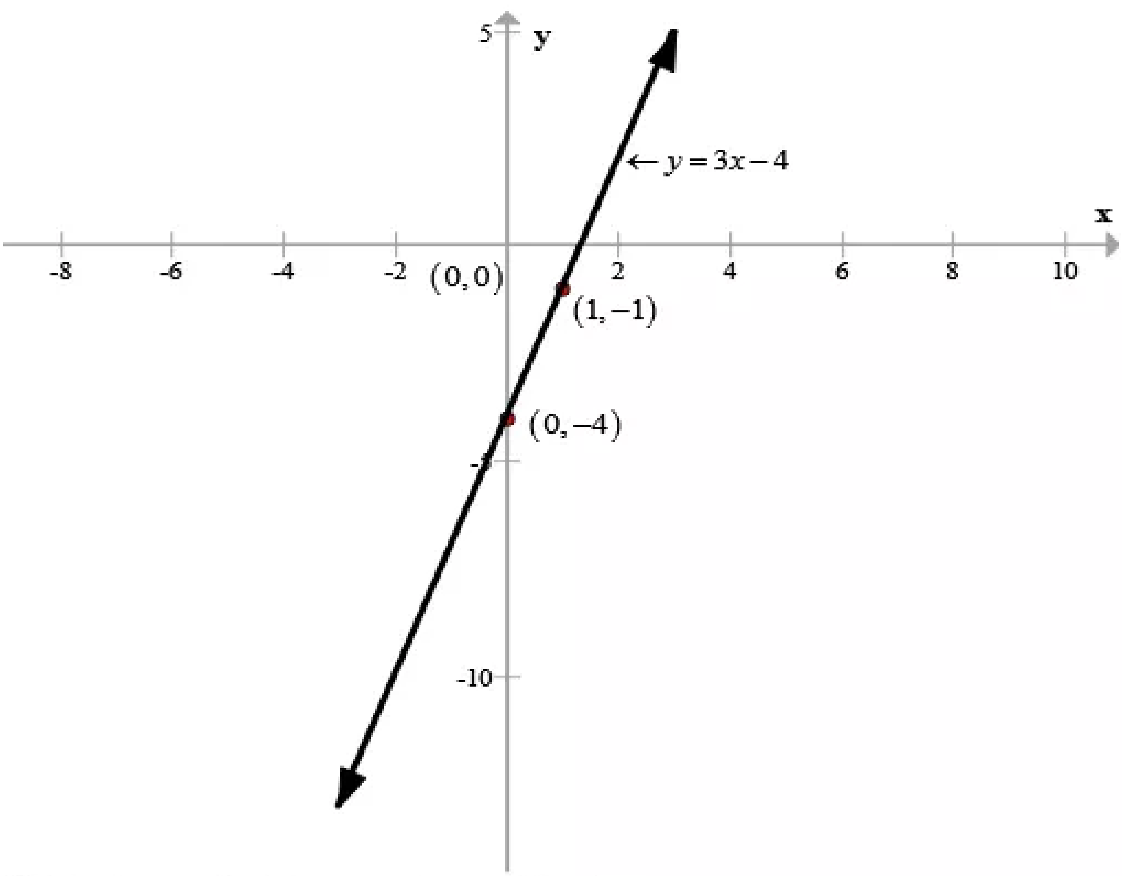
Comparing the equation (2) with the equation (1), we have

$$m = 3, b = -4$$

Therefore the y-intercept is -4, so the point is $(0,-4)$.

Again the slope is $\frac{3}{1}$. So, we plot a second point on the line by starting at $(0,-4)$ and then moving up 3 units and right 1 unit. The second point is $(1,-1)$.

Now, we draw a line through the two points $(0,-4)$ and $(1,-1)$ as follows:



This is the graph of the equation $y = 3x - 4$.

Answer 12gp.

Given equation is

$$3x-2y=12 \qquad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax+By=C$$

where A,B and C are constants.

We write the equation (1) in standard form is

$$3x-2y=12$$

To identify the x-intercept putting $y=0$ in the equation (1) and solving for x.

$$3x-2(0)=12 \qquad [\text{Let } y=0]$$

$$x=4 \qquad [\text{Solve for } x]$$

So, the x-intercept is 4.

From the x-intercept the point is $(4,0)$.

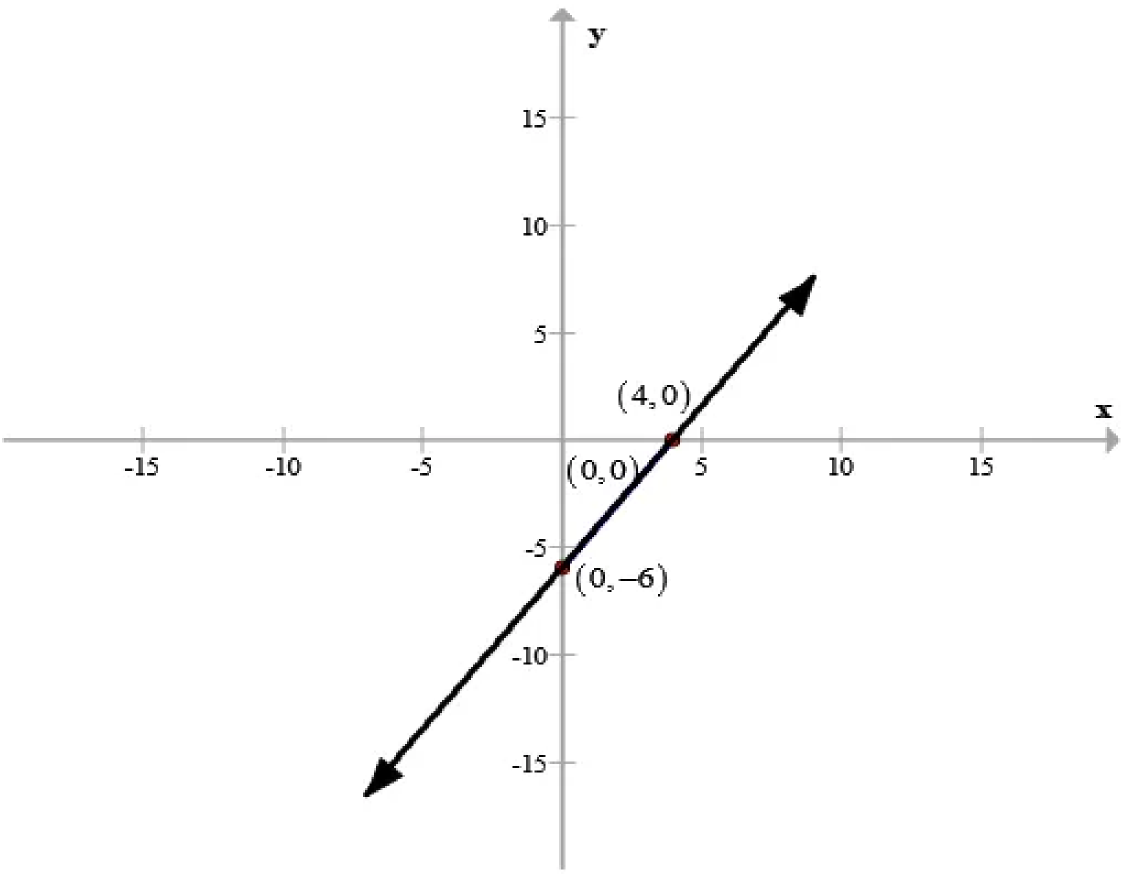
Again, to identify the y-intercept putting $x=0$ in the equation (1) and solving for y.

$$3(0)-2y=12 \qquad [\text{Let } x=0]$$

$$y=-6 \qquad [\text{Solve for } y]$$

So, the y-intercept the point is $(0,-6)$.

Now, we draw a line through the points $(4,0)$ and $(0,-6)$ as follows:



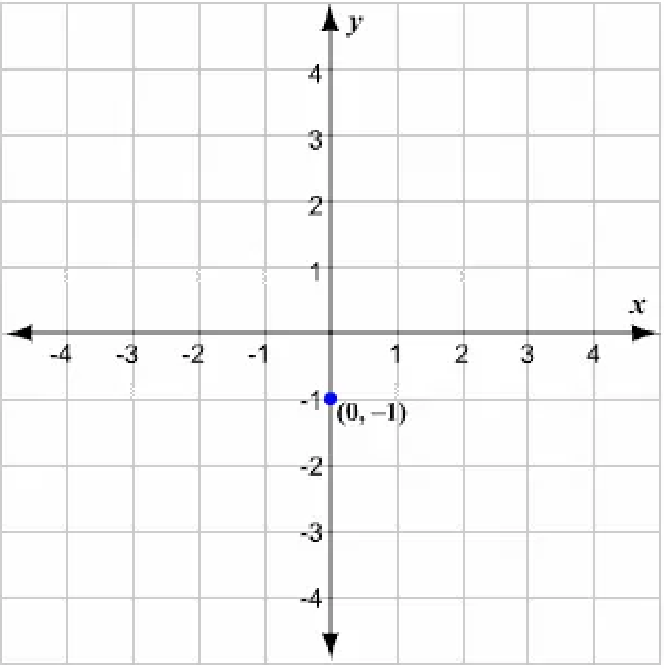
This is the graph of the equation $3x-2y=12$.

Answer 13e.

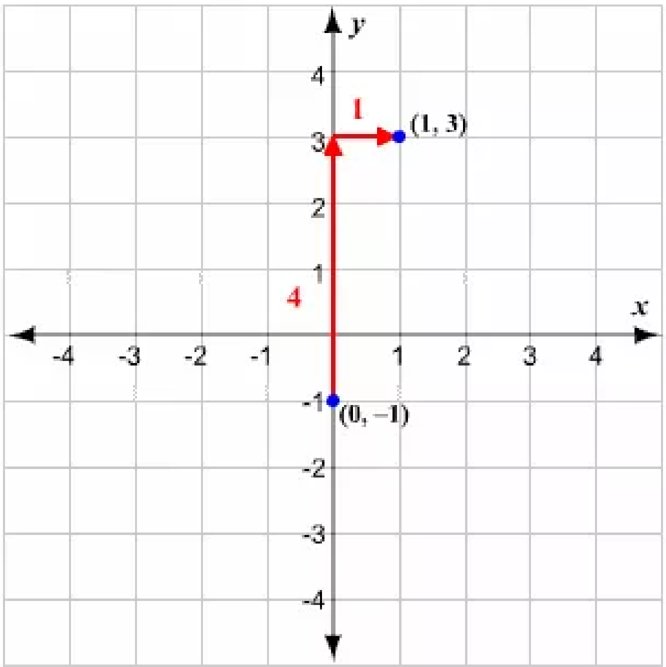
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is 4, and b is -1.

STEP 2 The y-intercept is -1. Plot the point $(0, -1)$ on a coordinate plane where the line crosses the y-axis.

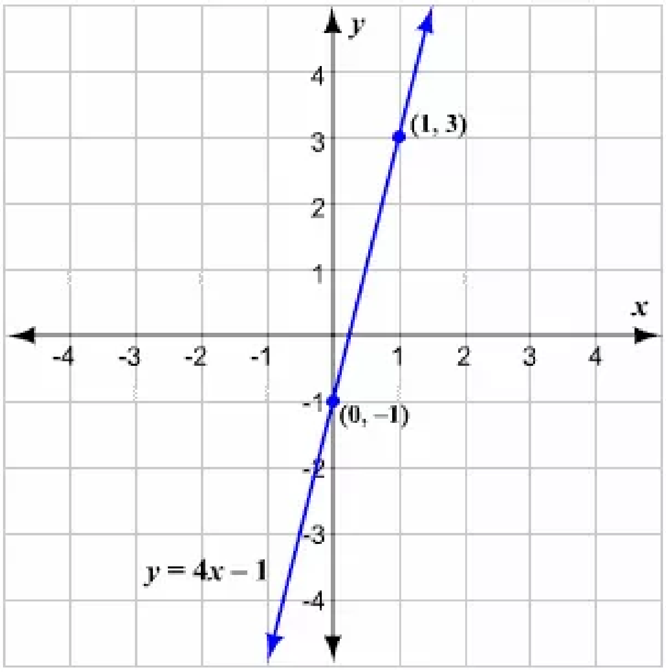


STEP 3 Use the slope to plot a second point on the line. Since the slope is 4, or $\frac{4}{1}$, start at $(0, -1)$ and then move 4 units up. Now, move 1 unit to the right.



The second point is $(1, 3)$.

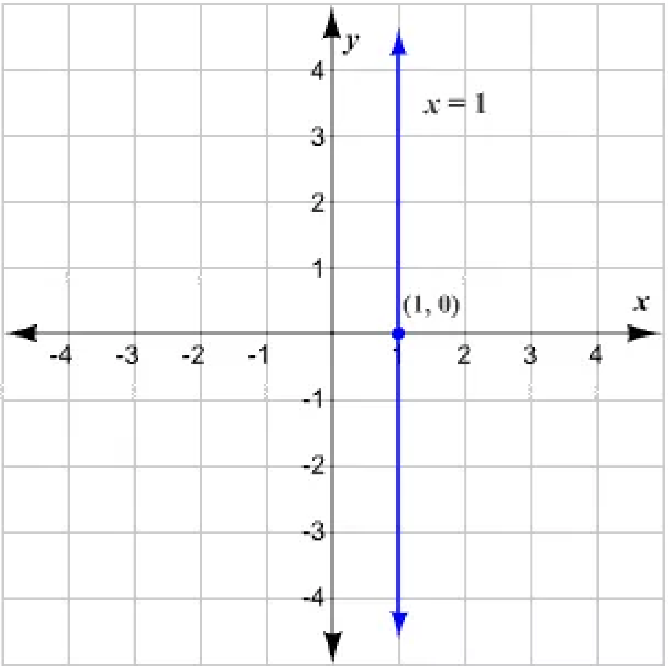
STEP 4 Finally, draw a line through the two points.



Answer 13gp.

We know that the graph of an equation of the form $x = c$ is the vertical line through $(c, 0)$, where c is the x-intercept.

Thus, for graphing the given equation, plot the intercept (1, 0) on a coordinate plane and draw a vertical line through it. Every point on the line must have an x-coordinate of 1.



Answer 14e.

The given equation is

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

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

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

$$y = \frac{2}{3}x + (-2) \qquad \text{...... (2)}$$

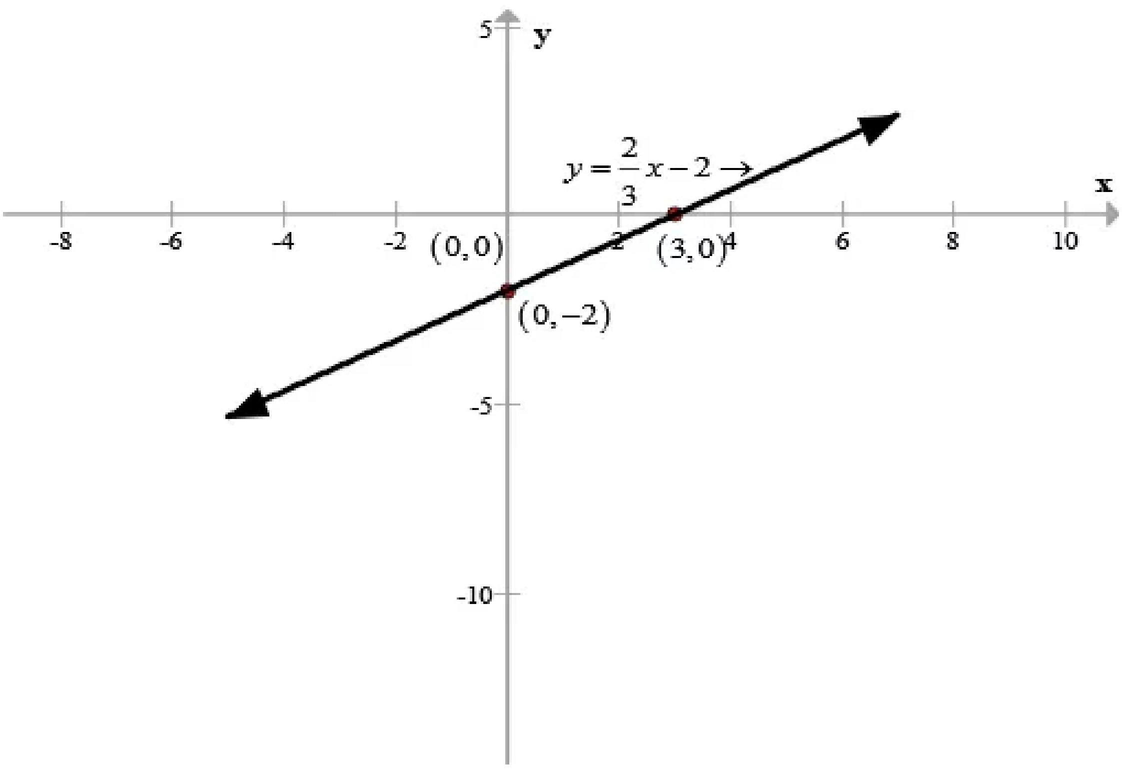
Comparing the equation (2) with the equation (1), we have

$$m = \frac{2}{3}, b = -2$$

Therefore the y-intercept is -2, so the point is $(0, -2)$.

Again the slope is $\frac{2}{3}$. So, we plot a second point on the line by starting at $(0, -2)$ and then moving up 2 units and right 3 units. The second point is $(3, 0)$.

Now, we draw a line through the two points $(0, -2)$ and $(3, 0)$ as follows:



This is the graph of the equation $y = \frac{2}{3}x - 2$.

Answer 14gp.

Given equation is

$$y = -4 \qquad \text{...... (1)}$$

The standard form of a linear equation is

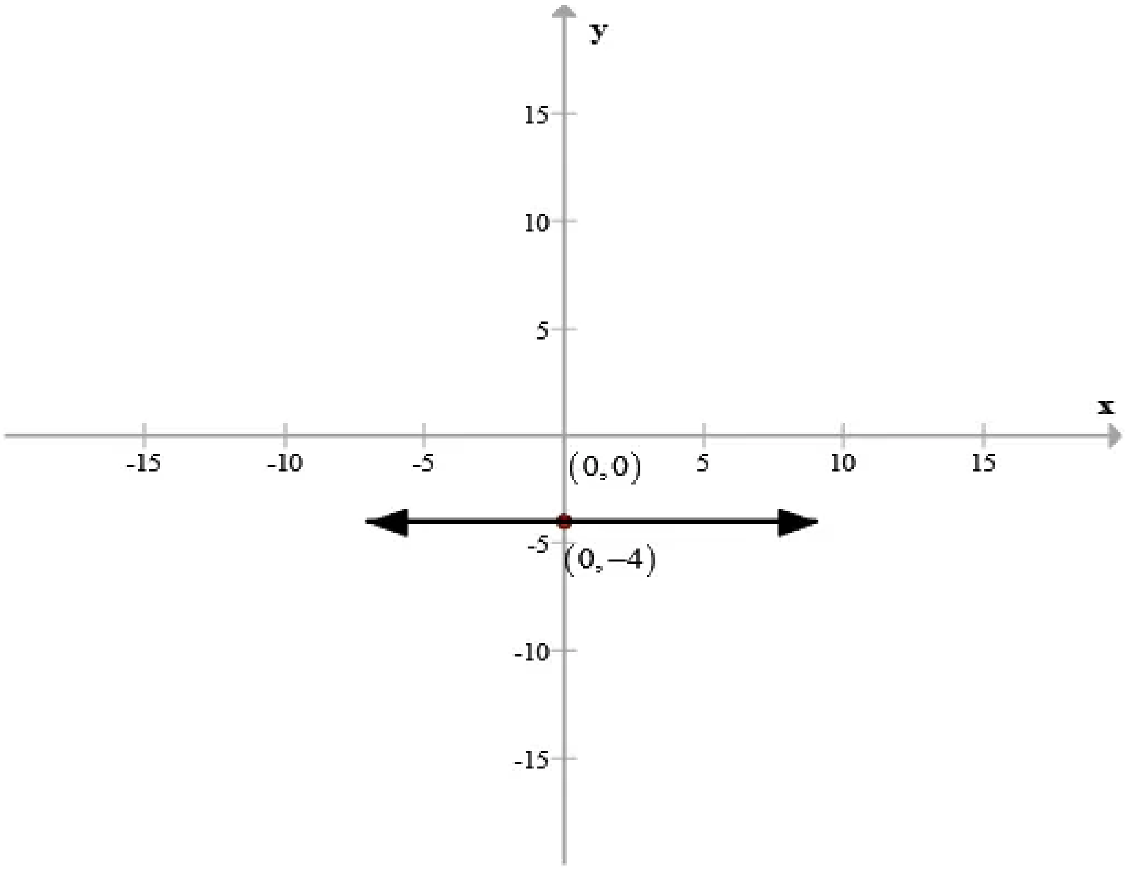
$$Ax + By = C$$

where A,B and C are constants.

The graph of $y = -4$ is the horizontal line that passes through the point $(0,-4)$.
So, every point on the line has a y-coordinate of -4

.

Now, we draw a line through the points $(0,-4)$ as follows:



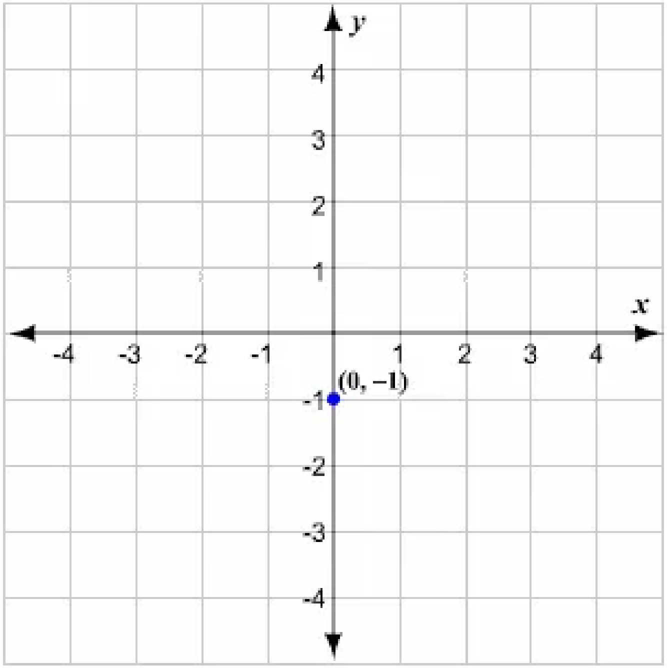
This is the graph of the equation $y = -4$.

Answer 15e.

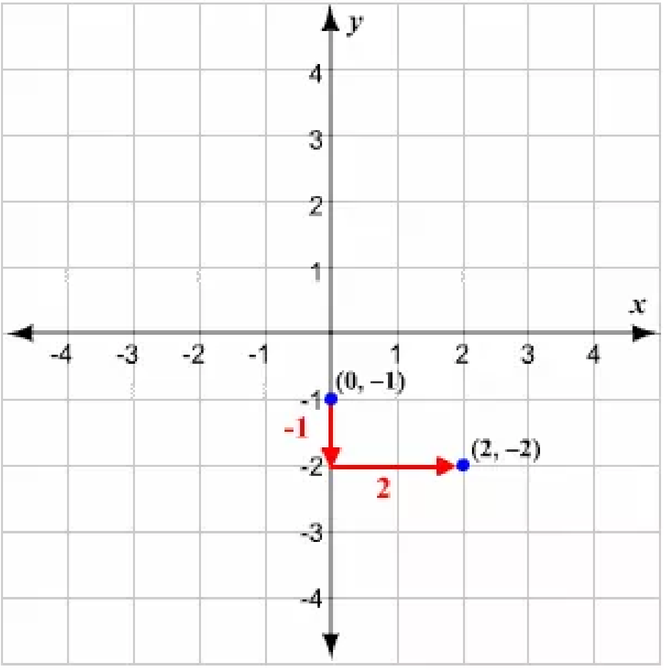
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is $-\frac{1}{2}$, and b is -1.

STEP 2 The y-intercept is -1. Plot the point $(0, -1)$ on a coordinate plane where the line crosses the y-axis.

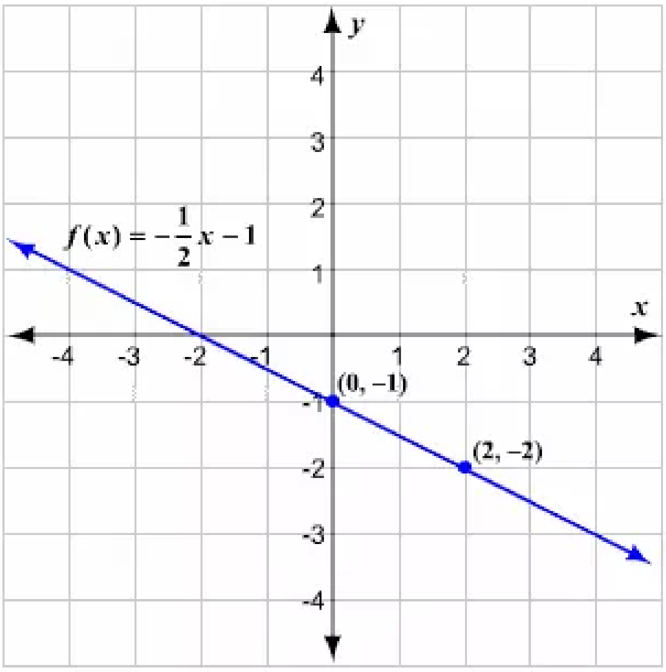


STEP 3 Use the slope to plot a second point on the line. Since the slope is $-\frac{1}{2}$, or $\frac{-1}{2}$, start at $(0, -1)$ and then move 1 unit down. Now, move 2 units to the right.



The second point is $(2, -2)$.

STEP 4 Finally, draw a line through the two points.



Answer 16e.

The given equation is

$$f(x) = -\frac{5}{4}x + 1$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$$f(x) = \left(-\frac{5}{4}\right)x + 1 \qquad \text{...... (2)}$$

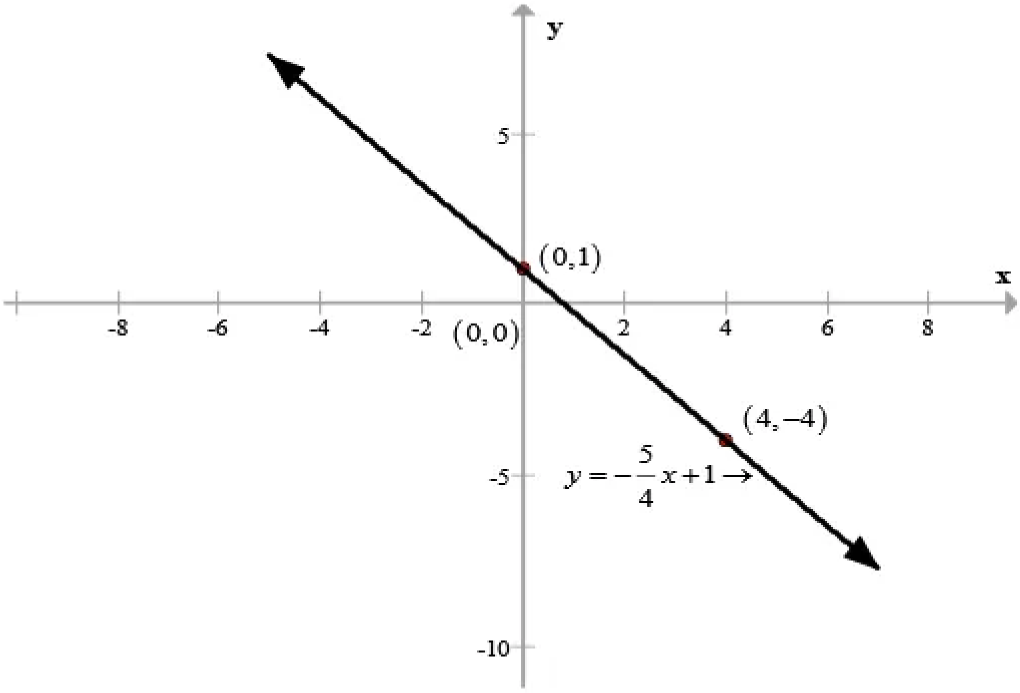
Comparing the equation (2) with the equation (1), we have

$$m = -\frac{5}{4}, b = 1$$

Therefore the y-intercept is 1, so the point is $(0,1)$.

Again the slope is $\frac{-5}{4}$. So, we plot a second point on the line by starting at $(0,1)$ and then moving down 5 units and right 4 units. The second point is $(4,-4)$.

Now, we draw a line through the two points $(0,1)$ and $(4,-4)$ as follows:



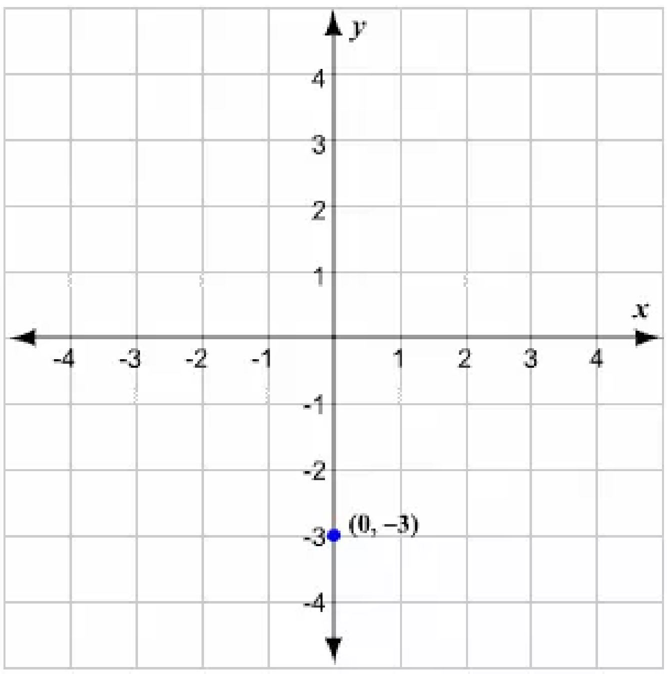
This is the graph of the equation $f(x)=-\frac{5}{4}x+1$.

Answer 17e.

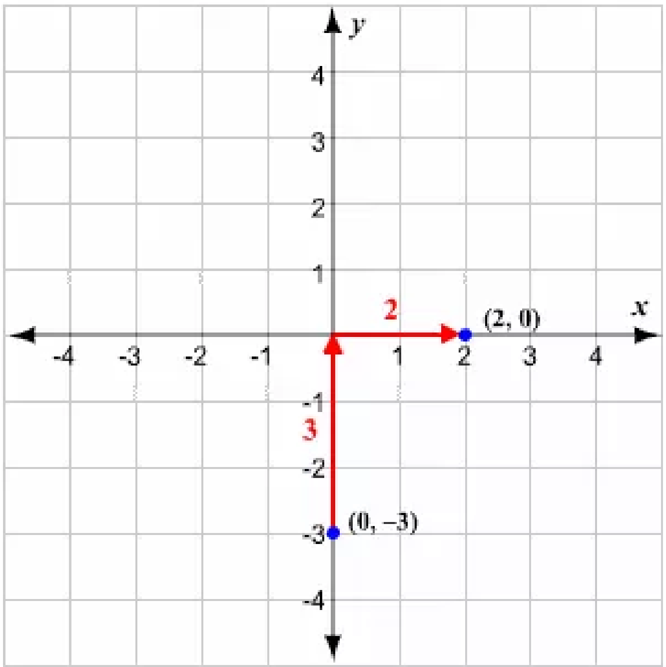
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is $\frac{3}{2}$, and b is -3.

STEP 2 The y-intercept is -3. Plot the point $(0, -3)$ on a coordinate plane where the line crosses the y-axis.

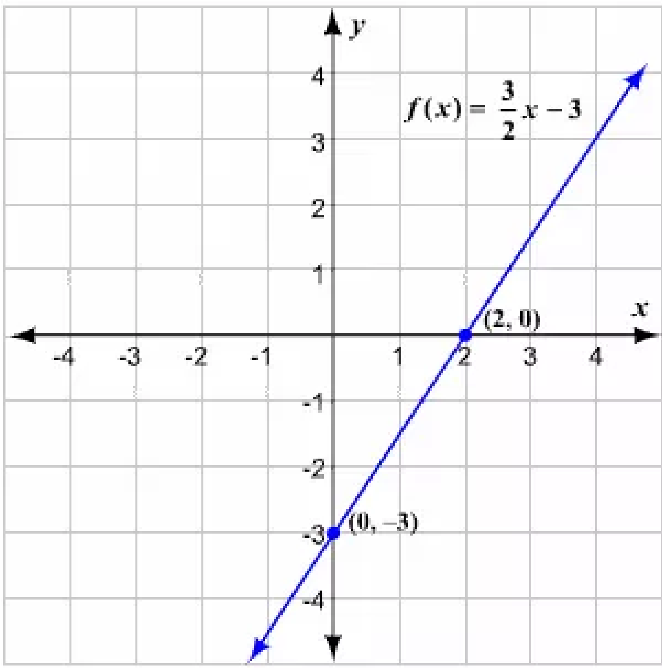


STEP 3 Use the slope to plot a second point on the line. Since the slope is $\frac{3}{2}$, start at (0, −3) and then move 3 units up. Now, move 2 units to the right.



The second point is (2, 0).

STEP 4 Finally, draw a line through the two points.



Answer 18e.

The given equation is

$$f(x)=\frac{5}{3}x+4$$

The slope intercept of the equation of a line is

$$y=mx+b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$$f(x)=\frac{5}{3}x+4 \qquad \text{...... (2)}$$

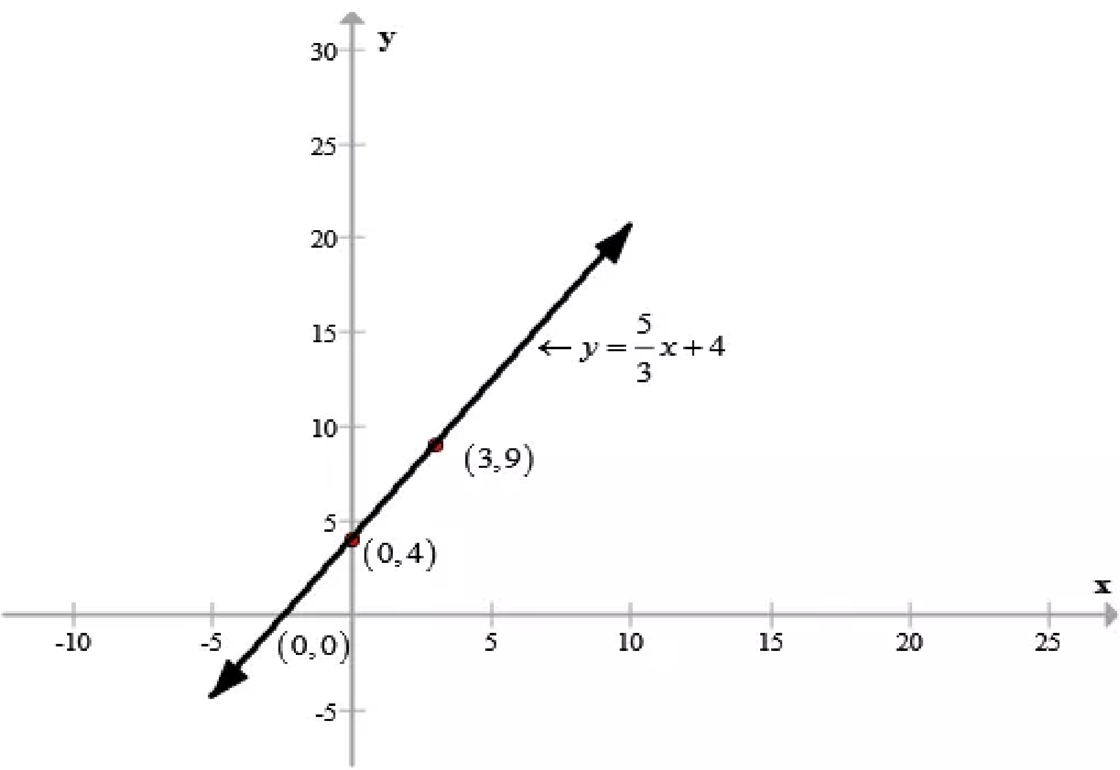
Comparing the equation (2) with the equation (1), we have

$$m=\frac{5}{3}, b=4$$

Therefore the y-intercept is4, so the point is $(0,4)$.

Again the slope is $\frac{5}{3}$. So, we plot a second point on the line by starting at $(0,4)$ and then moving up 5 units and right 3 units. The second point is $(3,9)$.

Now, we draw a line through the two points $(0,4)$ and $(3,9)$ as follows:



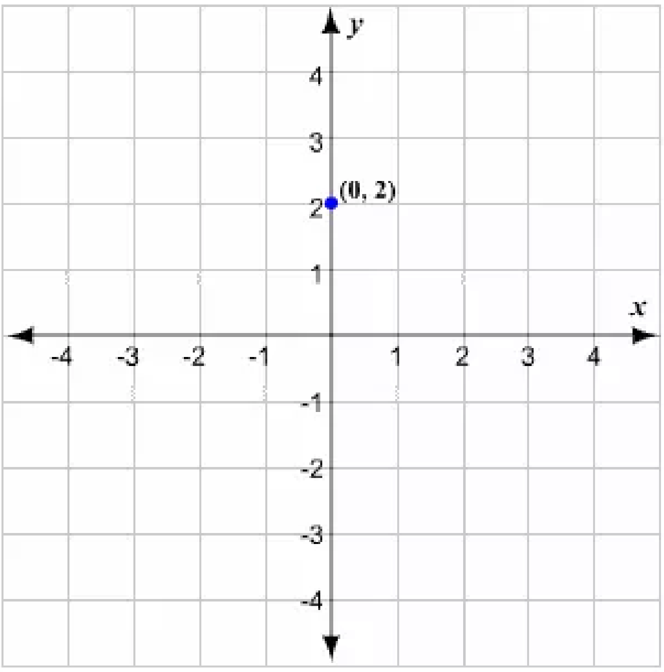
This is the graph of the equation $f(x)=\frac{5}{3}x+4$.

Answer 19e.

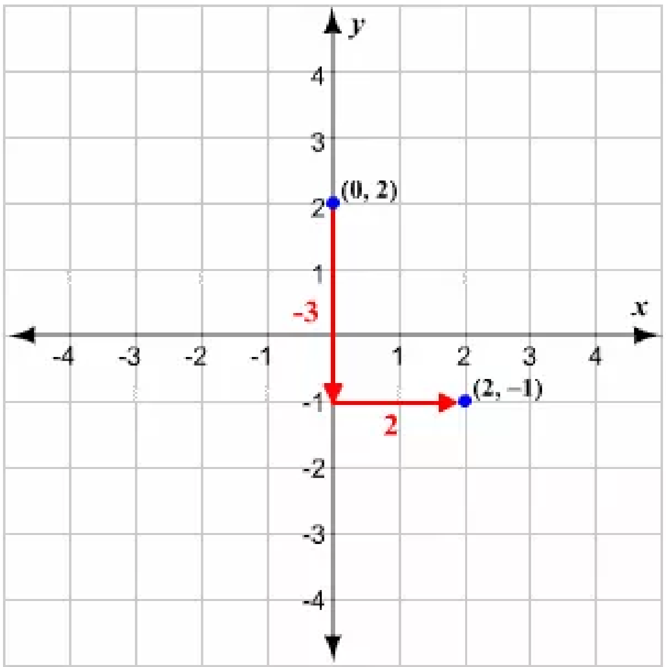
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is -1.5, and b is 2.

STEP 2 The y-intercept is 2. Plot the point (0, 2) on a coordinate plane where the line crosses the y-axis.

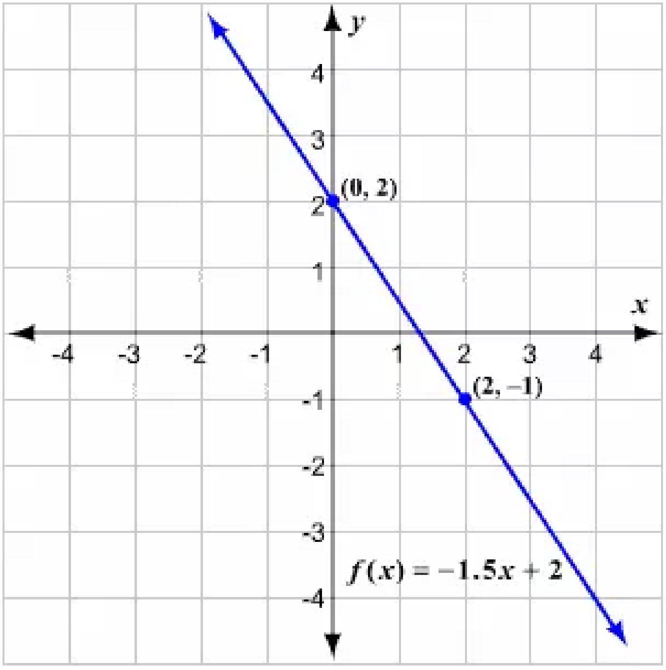


STEP 3 Use the slope to plot a second point on the line. Since the slope is -1.5 or $\frac{-3}{2}$, start at (0, 2) and then move 3 units down. Now, move 2 units to the right.



The second point is $(2, -1)$.

STEP 4 Finally, draw a line through the two points.



Answer 20e.

The given equation is

$$f(x)=3x-1.5$$

The slope intercept of the equation of a line is

$$y=mx+b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$$f(x)=3x-1.5$$

$$f(x)=3x+(-1.5) \qquad \text{...... (2)}$$

Comparing the equation (2) with the equation (1), we have

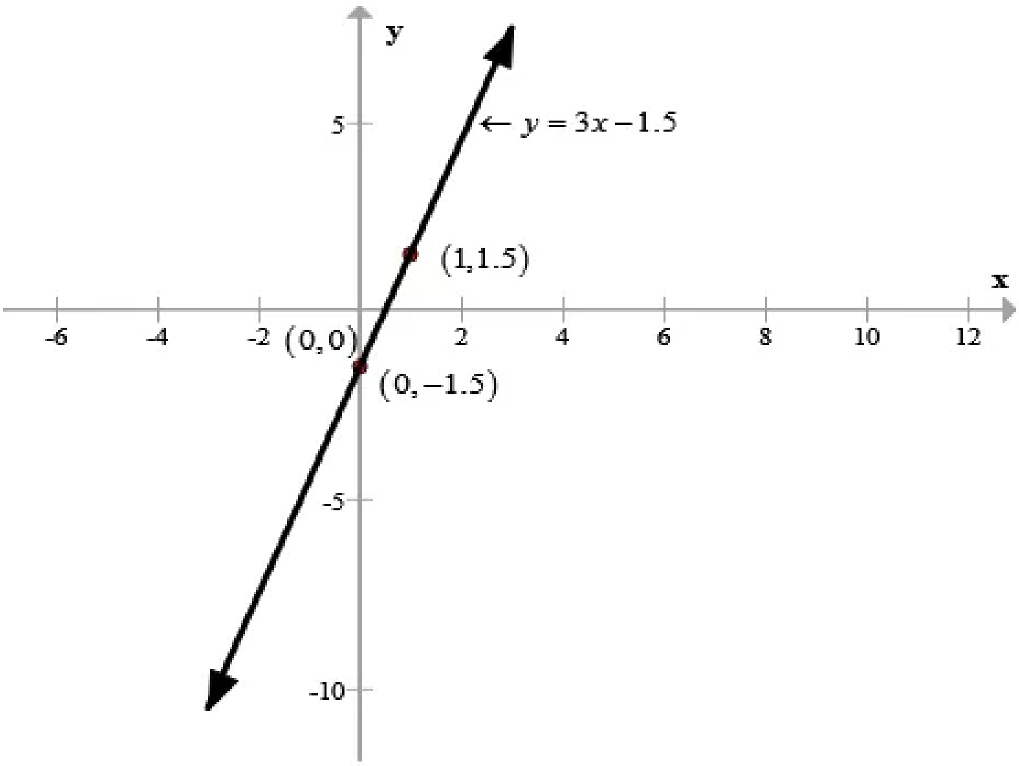
$$m=3, b=-1.5$$

Therefore the y-intercept is -1.5

, so the point is $(0,-1.5)$.

Again the slope is $\frac{3}{1}$. So, we plot a second point on the line by starting at $(0,-1.5)$ and then moving up 3 units and right 1 unit. The second point is $(1,1.5)$.

Now, we draw a line through the two points $(0,-1.5)$ and $(1,1.5)$ as follows:



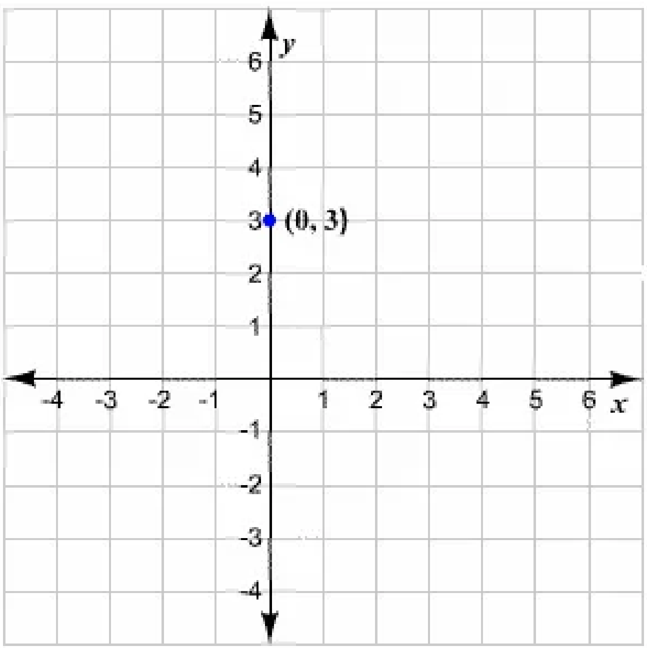
This is the graph of the equation $f(x) = 3x - 1.5$.

Answer 21e.

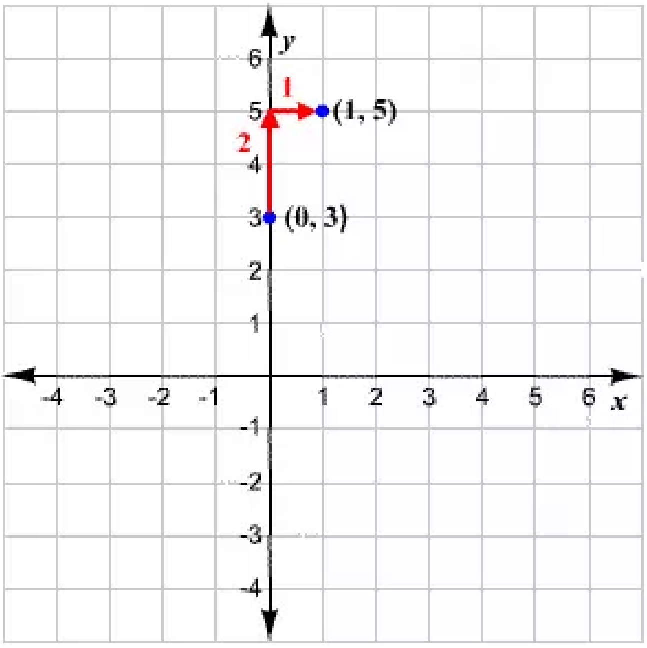
A line with equation $y = mx + b$ has slope m and y-intercept b. On comparing the given equation with the general form, we find that the slope of the given line is 2 and the y-intercept is 3. Thus, the graph of the given equation should intersect the y-axis at (0, 3).

The error in graphing the equation is that the slope and the y-intercept are switched around.

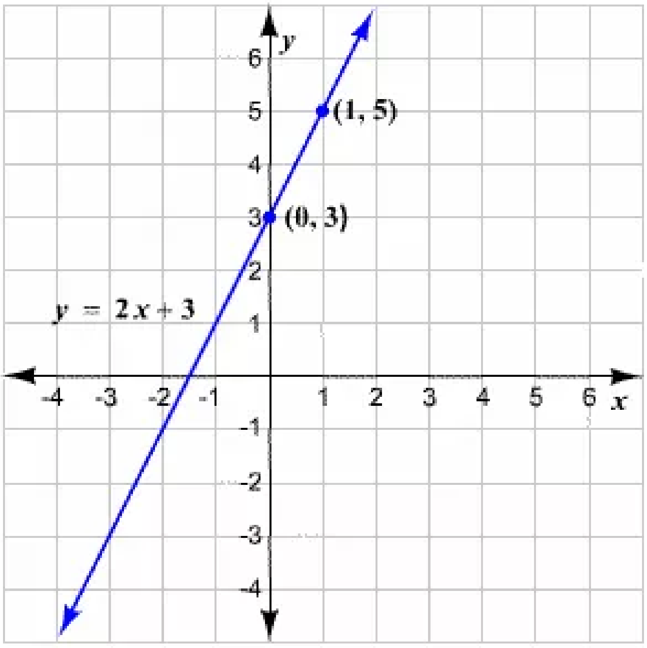
In order to correct the error, first plot the point (0, 3) on a coordinate plane.



Use the slope to plot a second point on the line. Since the slope is 2, or $\frac{2}{1}$, start at (0, 3) and then move up 2 units and right 1 unit. The second point is (1, 5).



Finally, draw a line through the two points.

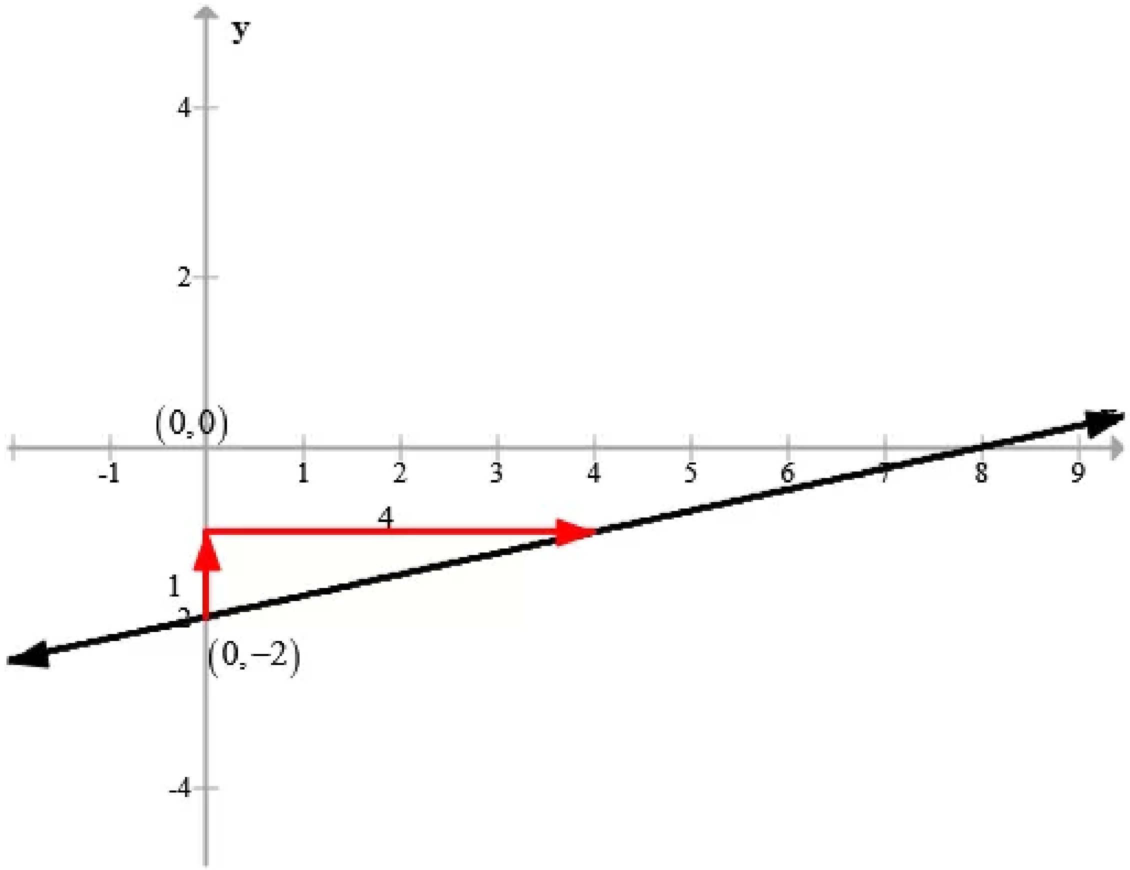


Answer 22e.

The given equation is

$$y = 4x - 2$$

Here we need to correct the error in the graph of $y = 4x - 2$ in given below.



The slope intercept of the equation of a line is

$$y = mx + b \qquad \ldots\ldots (1)$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$$y = 4x - 2$$

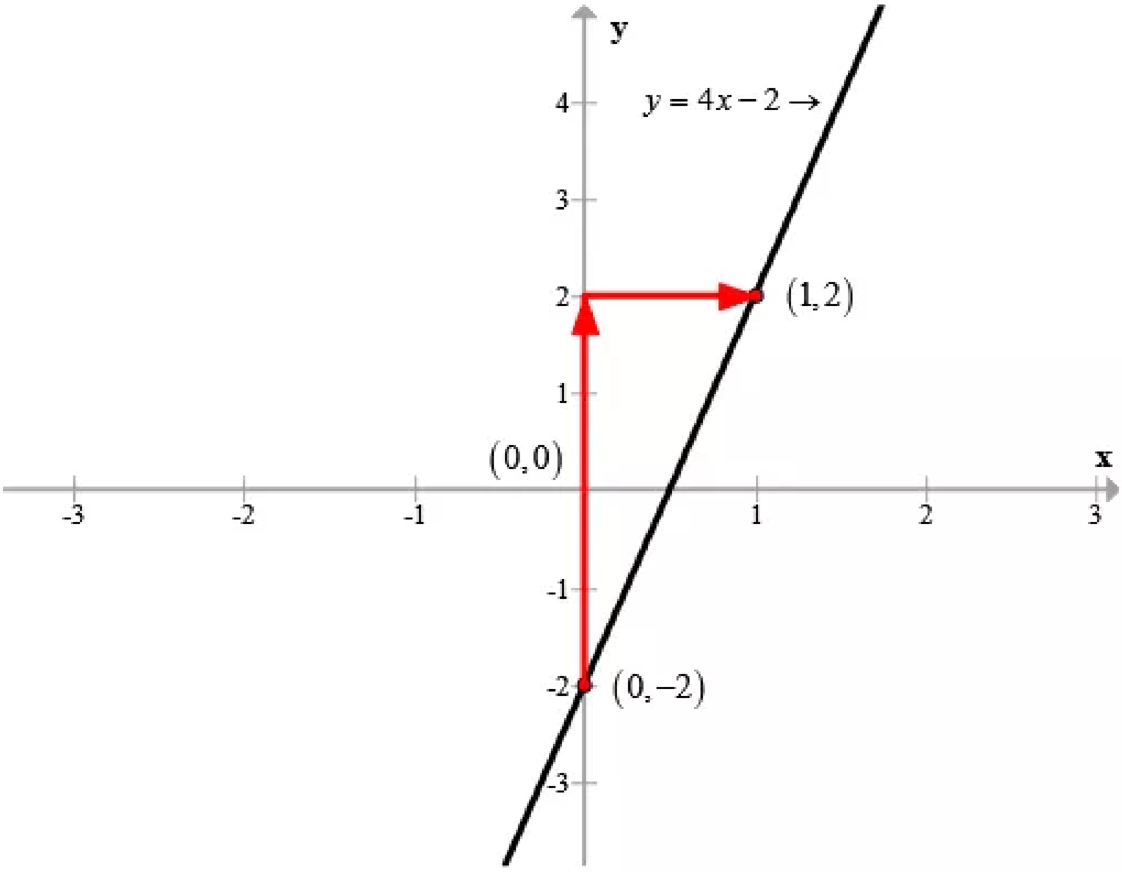
Comparing the equation (2) with the equation (1), we have

$$m = 4, b = -2$$

Therefore the y-intercept is the point $(0,-2)$.

Again the slope is $\frac{4}{1}$. So, we plot a second point on the line by starting at $(0,-2)$ and then moving up 4 units and right 1 unit. The second point is $(1,2)$.

In graphing the equation, to find the second point by staring at $(0,-2)$ and then move up 1 units and right 4 units is not correct. So the graph of the equation is not correct.
To find the correct graph, we draw a line through the two points $(0,-2)$ and $(1,2)$ as follows:



Answer 23e.

The slope-intercept form of a linear equation is $y=mx+b$. For writing the given equation in slope-intercept form, first we have to subtract $4x$ from both the sides.

$$4x - 3y - 4x = 18 - 4x$$
$$-3y = 18 - 4x$$

Now, isolate y. For this, divide both the sides by -3.

$$\frac{-3y}{-3} = \frac{18-4x}{-3}$$

$$y = -6 + \frac{4}{3}x \text{ or } y = \frac{4}{3}x - 6$$

The slope-intercept form of the given equation is $y = \frac{4}{3}x - 6$. Thus, the correct answer is choice **C**.

Answer 24e.

Given equation is

$$x - y = 4 \qquad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

We write the equation (1) in standard form is

$$x - y = 4$$

To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.

$$x - 0 = 4 \qquad [\text{Let } y = 0]$$

$$x = 4 \qquad [\text{Solve for } x]$$

So, the x-intercept is 4.

From the x-intercept the point is $(4,0)$.

Again, to identify the y-intercept putting $x = 0$ in the equation (1), and solving for y.

$$0 - y = 4 \qquad [\text{Let } x = 0]$$

$$y = -4 \qquad [\text{Solve for } y]$$

So, the y-intercept the point is $(0,-4)$.

Therefore the x and y-intercept of the line with the equation $x - y = 4$ is 4 and -4

Answer 25e.

The x-coordinate of a point where a graph intersects the x-axis is called an x-intercept.

For finding the x-intercept, substitute 0 for y in the equation.

$x + 5(0) = -15$

Now, solve for x.

$$x + 0 = -15$$

$$x = -15$$

The x-intercept of the line with the given equation is -15.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept.

Substitute 0 for x in the equation to find the y-intercept.

$0 + 5y = -15$

Solve for y.

$$5y = -15$$

$$\frac{5y}{5} = \frac{-15}{5}$$

$$y = -3$$

Therefore, the y-intercept of the line with the given equation is -3.

Answer 26e.

Given equation is

$$3x - 4y = -12$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

We write the equation (1) in standard form is

$$3x - 4y = -12$$

To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.

$$3x - 4(0) = -12 \qquad [\text{Let } y = 0]$$

$$x = -4 \qquad [\text{Solve for } x]$$

So, the x-intercept is -4.

From the x-intercept the point is $(-4, 0)$.

Again, to identify the y-intercept putting $x = 0$ in the equation (1), and solving for y.

$$3(0) - 4y = -12 \qquad [\text{Let } x = 0]$$

$$y = 4 \qquad [\text{Solve for } y]$$

So, the y-intercept the point is $(0, 4)$.

Therefore the x and y-intercept of the line with the equation $3x - 4y = -12$ is -4 and 4.

Answer 27e.

The x-coordinate of a point where a graph intersects the x-axis is called an x-intercept.

For finding the x-intercept, first substitute 0 for y in the equation.

$$2x - 0 = 10$$

Now, solve for x.

$$2x = 10$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$x = 5$$

The x-intercept of the line with the given equation is 5.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept.

Substitute 0 for x in the equation to find the y-intercept.
$2(0) - y = 10$

Solve for y.
$-y = 10$
$y = -10$

Therefore, the y-intercept of the line with the given equation is -10.

Answer 28e.

Given equation is
$$4x - 5y = 20 \qquad \ldots\ldots (1)$$
The standard form of a linear equation is
$$Ax + By = C$$
where A,B and C are constants.

We write the equation (1) in standard form is
$$4x - 5y = 20$$
To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.
$4x - 5(0) = 20$ [Let $y = 0$]
$x = 5$ [Solve for x]
So, the x-intercept is 5.
From the x-intercept the point is $(5, 0)$.
Again, to identify the y-intercept putting $x = 0$ in the equation (1), and solving for y.
$4(0) - 5y = 20$ [Let $x = 0$]
$y = -4$ [Solve for y]
So, the x-intercept is -4.
From the y-intercept the point is $(0, -4)$.
Therefore the x and y-intercept of the line with the equation $4x - 5y = 20$ is 5 and -4.

Answer 29e.

The x-coordinate of a point where a graph intersects the x-axis is called an x-intercept.

For finding the x-intercept, first substitute 0 for y in the equation.
$-6x + 8(0) = -36$

Now, solve for x.
$-6x = -36$
$$\frac{-6x}{-6} = \frac{-36}{-6}$$
$x = 6$

The x-intercept of the line with the given equation is 6.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept.

Substitute 0 for x in the equation to find the y-intercept.
$-6(0) + 8y = -36$

Next, solve for y.

$$8y = -36$$
$$\frac{8y}{8} = \frac{-36}{8}$$
$$y = -4.5$$

Therefore, the y-intercept of the line with the given equation is -4.5.

Answer 30e.

Given equation is

$$5x - 6y = 30 \quad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

We write the equation (1) in standard form is

$$5x - 6y = 30$$

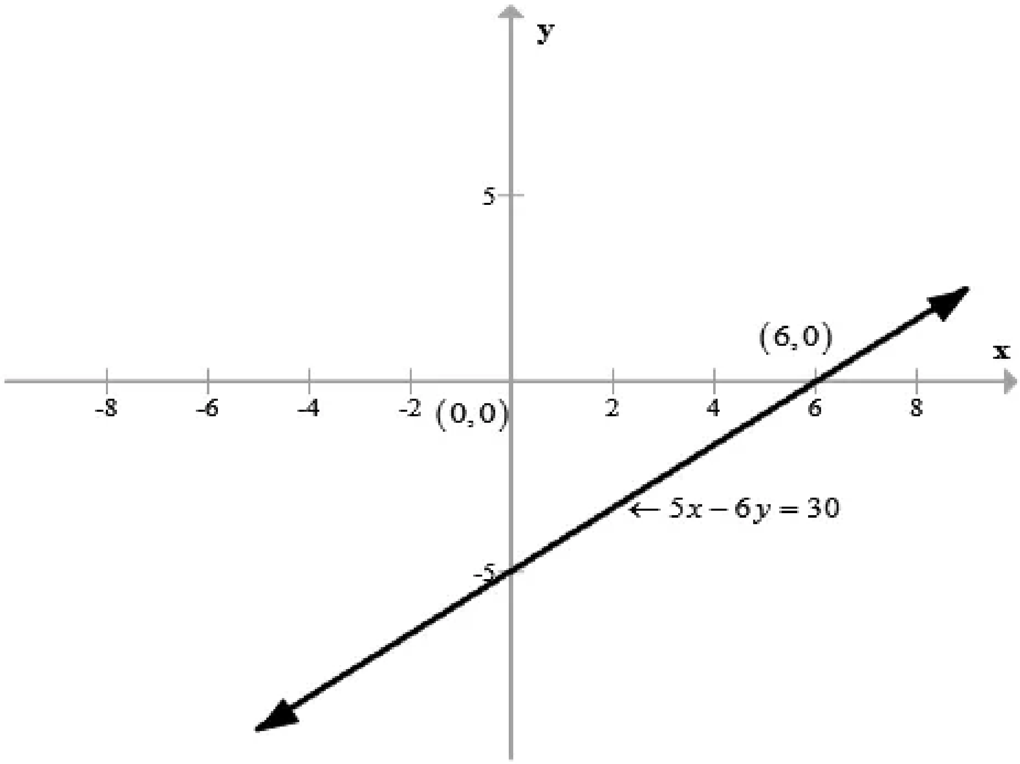
To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.

$$5x - 6(0) = 30 \quad [\text{Let } y = 0]$$
$$x = 6 \quad [\text{Solve for } x]$$

So, the x-intercept is 6.

From the x-intercept the point is $(6, 0)$.

The x-intercept of the graph $5x-6y=30$ as follows:



Answer 31e.

STEP 1 A linear equation of the form $Ax + By = C$, where A and B are not both zero, is said to be in standard form. Thus, the given equation is already in standard form.

STEP 2 Identify the x-intercept.

The x-coordinate of a point where a graph intersects the x-axis is the x-intercept. For finding the x-intercept, first substitute 0 for y in the equation.

$x+4(0)=8$

Next, solve for x.

$$x + 0 = 8$$
$$x = 8$$

Since the x-intercept is 8, the graph of the given equation crosses the x-axis at (8, 0).

STEP 3 Identify the y-intercept.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept. Substitute 0 for x in the equation to find the y-intercept.

$0+4y=8$

Next, solve for y.

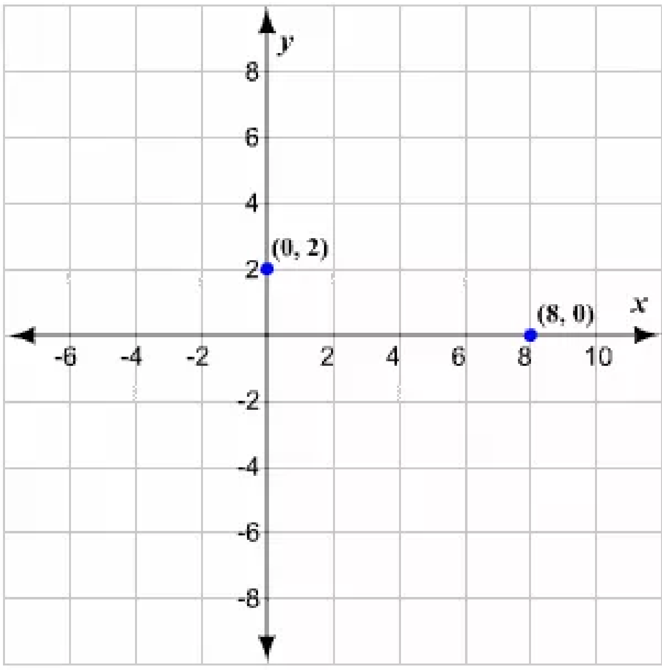
$$4y = 8$$

$$\frac{4y}{4} = \frac{8}{4}$$

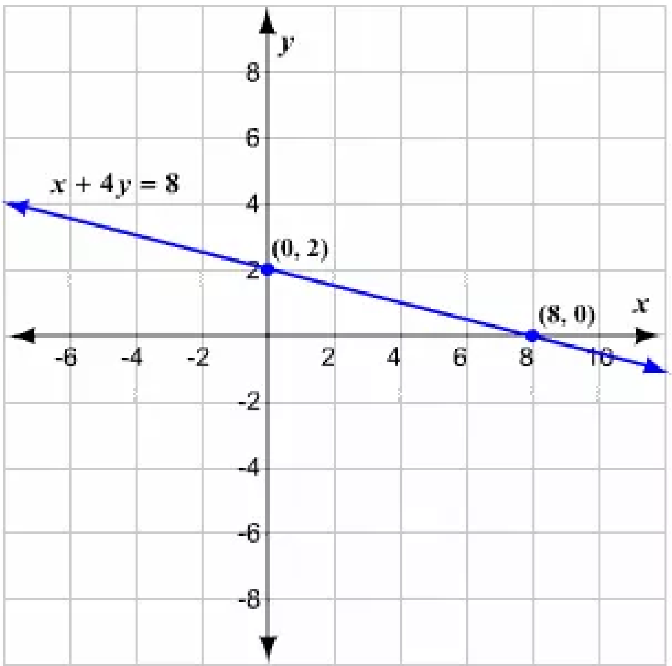
$$y = 2$$

The y-intercept of the line with the given equation is 2. Thus, the line crosses the y-axis at (0, 2).

STEP 4 For graphing the given equation, first plot the points (8, 0) and (0, 2) on a coordinate plane.



Now, draw a line through the two points.



Answer 32e.

Given equation is

$$2x-6y=-12 \qquad \ldots\ldots (1)$$

The standard form of a linear equation is

$$Ax+By=C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

$$2x-6y=-12$$

To identify the x-intercept putting $y=0$ in the equation (1) and solving for x.

$$2x-6(0)=-12 \qquad [\text{Let } y=0]$$

$$x=-6 \qquad [\text{Solve for } x]$$

So, the x-intercept is -6.

From the x-intercept the point is $(-6,0)$.

Again, to identify the y-intercept putting $x=0$ in the equation (1), and solving for y.

$$2(0)-6y=-12 \qquad [\text{Let } x=0]$$

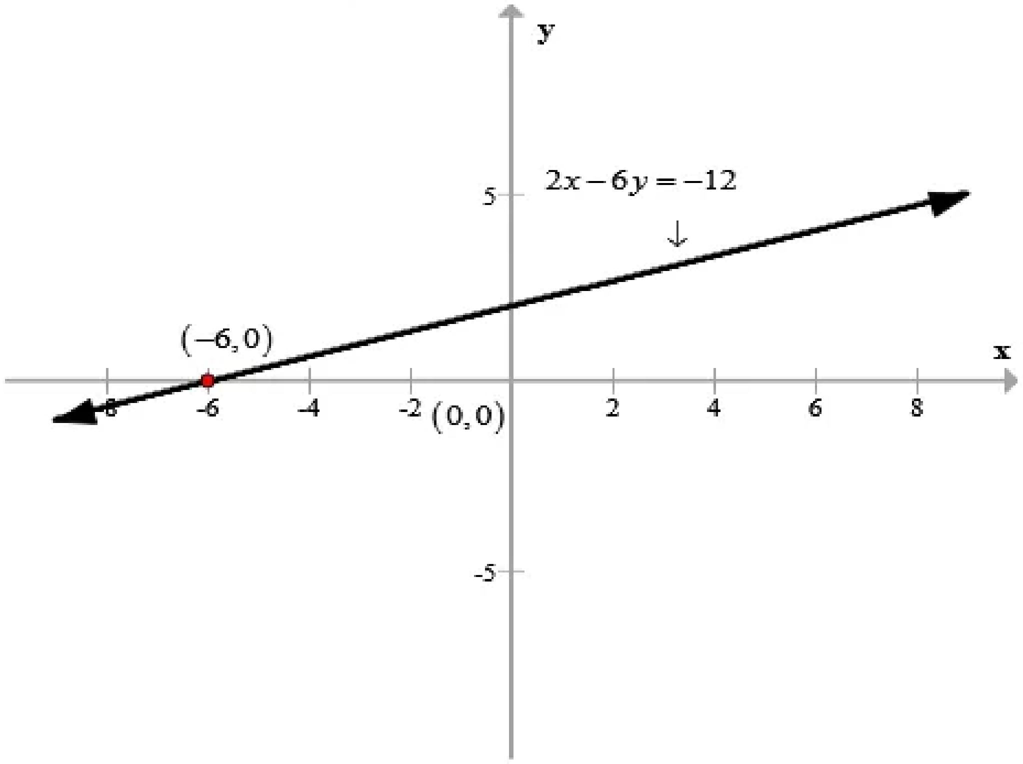
$$y=2 \qquad [\text{Solve for } y]$$

So, the y-intercept is -6.

From the y-intercept the point is $(0,2)$.

Therefore the x and y-intercept of the line with the equation $2x-6y=-12$ is -6 and 2.

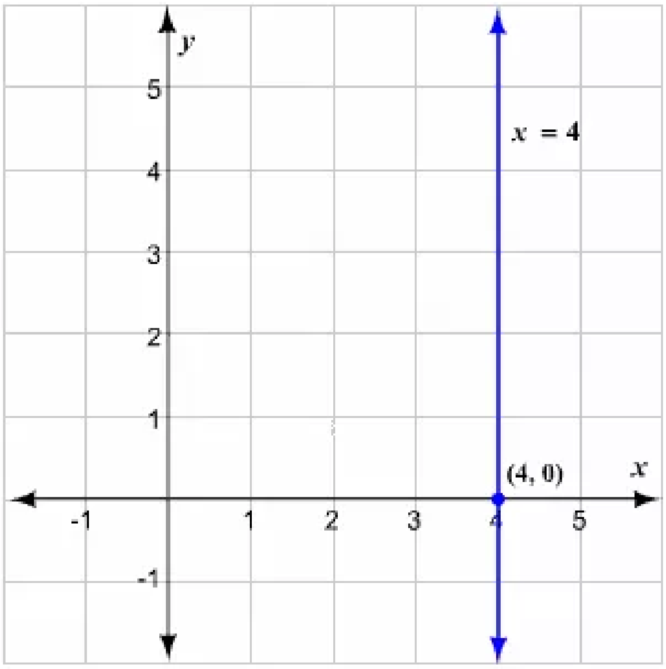
The graph of the equation $2x-6y=-12$ as follows:



Answer 33e.

We know that the graph of an equation of the form $x = c$ is the vertical line through $(c, 0)$, where c is the x-intercept.

Thus, for graphing the given equation, plot the intercept (4, 0) on a coordinate plane and draw a vertical line through it. Every point on the line must have an x-coordinate of 4.



Answer 34e.

Given equation is

$$y = -2 \qquad \text{...... (1)}$$

The standard form of a linear equation is

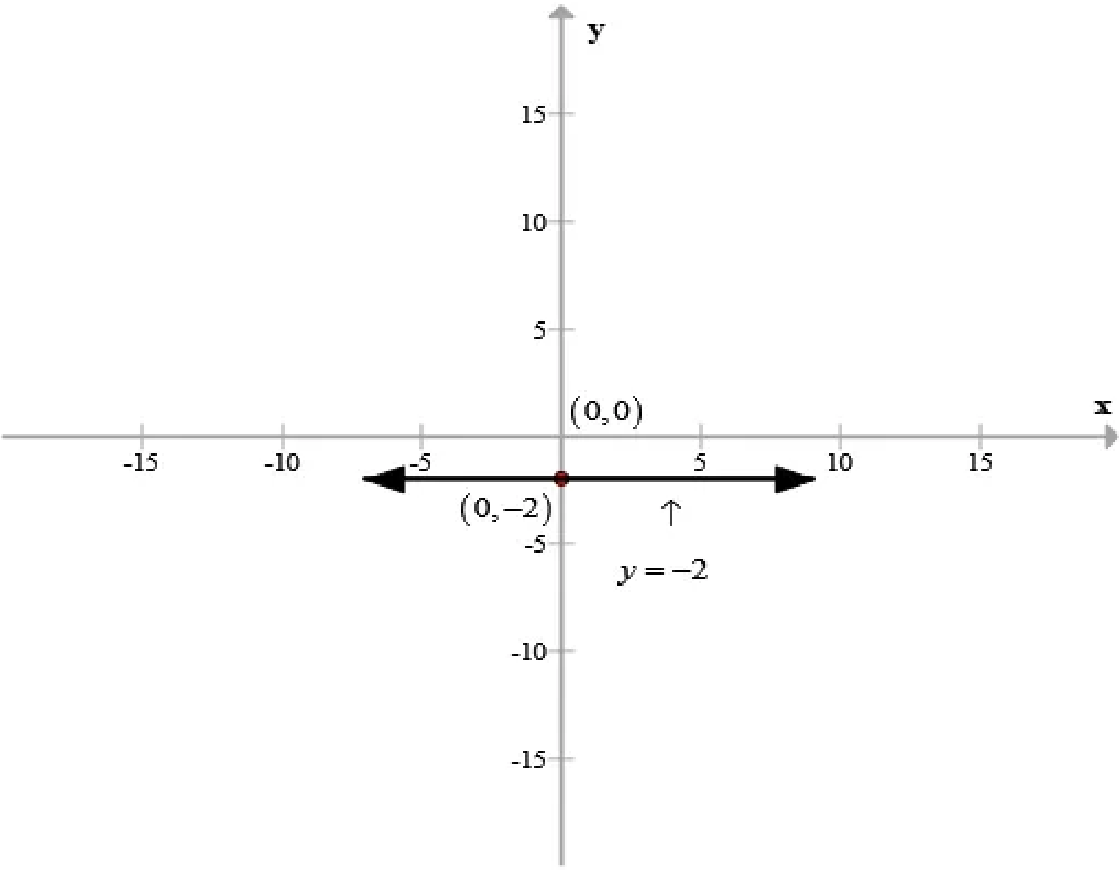
$$Ax + By = C$$

where A,B and C are constants.

The graph of $y = -2$ is the horizontal line that passes through the point $(0, -2)$.

So, every point on the line has a y-coordinate of -2.

Now, we draw a line through the points $(0,-2)$ as follows:



This is the graph of the equation $y=-2$.

Answer 35e.

STEP 1 A linear equation of the form $Ax + By = C$, where A and B are not both zero, is said to be in standard form. Thus, the given equation is already in standard form.

STEP 2 Identify the x-intercept.

The x-coordinate of a point where a graph intersects the x-axis is the x-intercept. For finding the x-intercept, first substitute 0 for y in the equation.

$5x - 0 = 3$

Next, solve for x.

$$5x = 3$$

$$\frac{5x}{5} = \frac{3}{5}$$

$$x = \frac{3}{5}$$

Since the x-intercept is $\frac{3}{5}$, the graph of the given equation crosses the x-axis at $\left(\frac{3}{5}, 0\right)$.

STEP 3 Identify the y-intercept.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept. Substitute 0 for x in the equation to find the y-intercept.

$5(0) - y = 3$

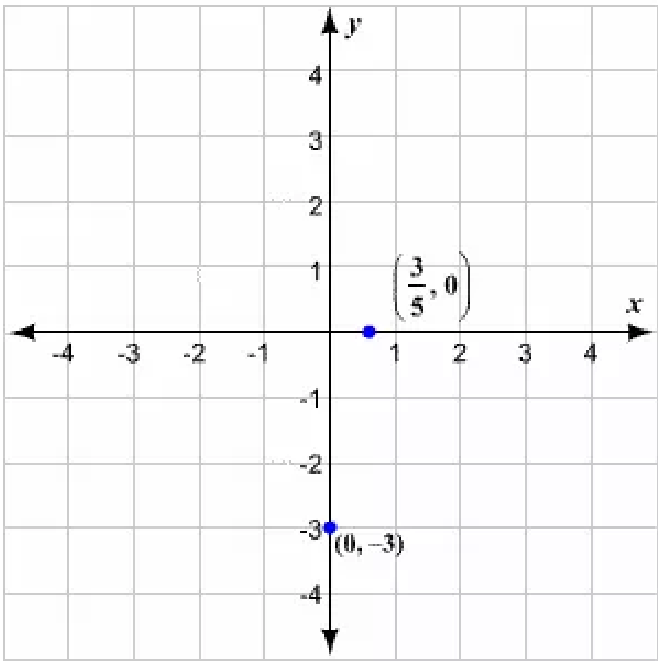
Next, solve for y.

$$-y = 3$$

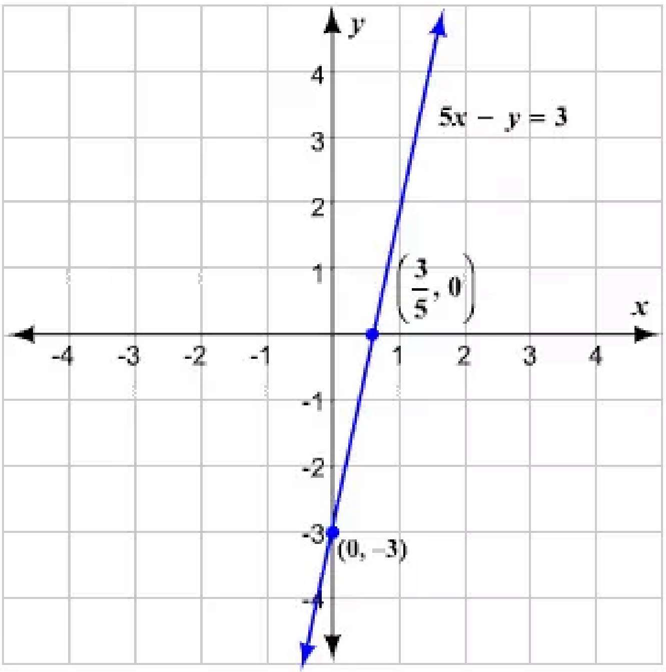
$$y = -3$$

The y-intercept of the line with the given equation is -3. Thus, the line crosses the y-axis at $(0, -3)$.

STEP 4 For graphing the given equation, first plot the points on a coordinate plane.



Now, draw a line through the two points.



Answer 36e.

Given equation is

$$3x + 4y = 12 \qquad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

$$3x + 4y = 12$$

To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.

$$3x + 4(0) = 12 \qquad [\text{Let } y = 0]$$

$$x = 4 \qquad [\text{Solve for } x]$$

So, the x-intercept is 4.

From the x-intercept the point is $(4,0)$.

Again, to identify the y-intercept putting $x = 0$ in the equation (1), and solving for y.

$$3(0) + 4y = 12 \qquad [\text{Let } x = 0]$$

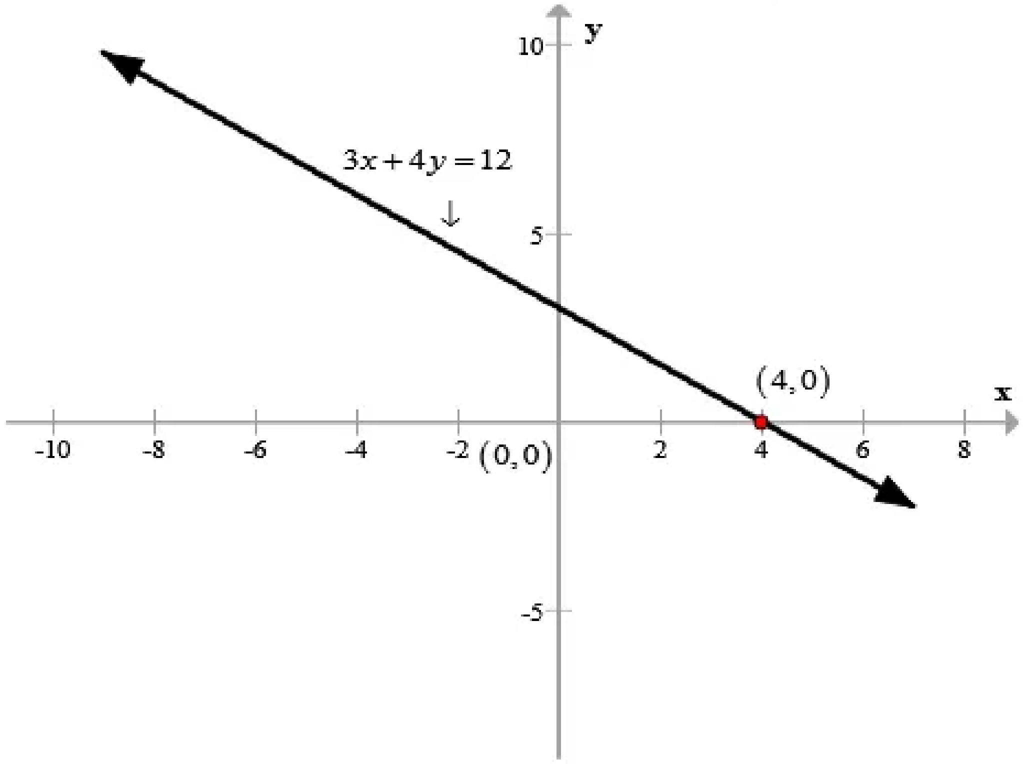
$$y = 3 \qquad [\text{Solve for } y]$$

So, the y-intercept is 3.

From the y-intercept the point is $(0,3)$.

Therefore the x and y-intercept of the line with the equation $3x + 4y = 12$ is 4 and 3.

The graph of the equation $3x+4y=12$ and we label x -intercept as follows:



Answer 37e.

STEP 1 A linear equation of the form $Ax + By = C$, where A and B are not both zero, is said to be in standard form. Thus, the given equation is already in standard form.

STEP 2 Identify the x-intercept.

The x-coordinate of a point where a graph intersects the x-axis is the x-intercept. For finding the x-intercept, first substitute 0 for y in the equation.

$-5x + 10(0) = 20$

Now, solve for x.

$$-5x = 20$$

$$\frac{-5x}{-5} = \frac{20}{-5}$$

$$x = -4$$

Thus, the x-intercept of the line with the given equation is -4.

STEP 3 Identify the y-intercept.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept. Substitute 0 for x in the equation to find the y-intercept.

$-5(0) + 10y = 20$

Solve for y.

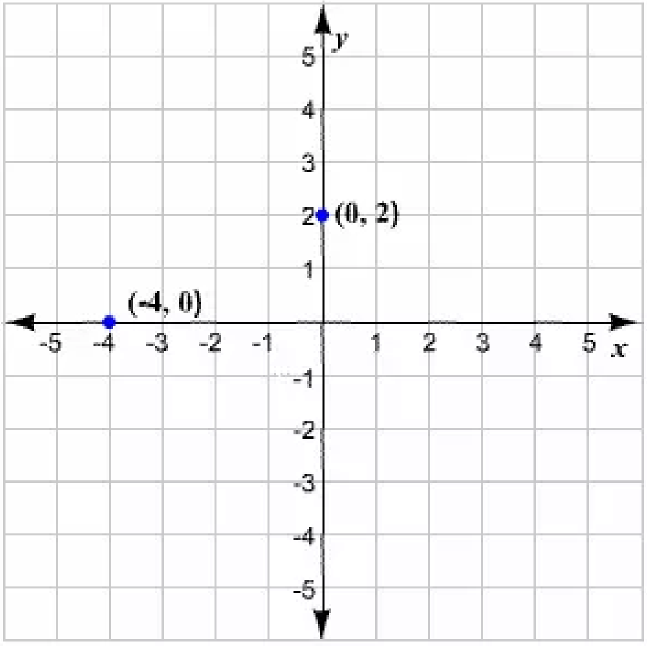
$$10y = 20$$

$$\frac{10y}{10} = \frac{20}{10}$$

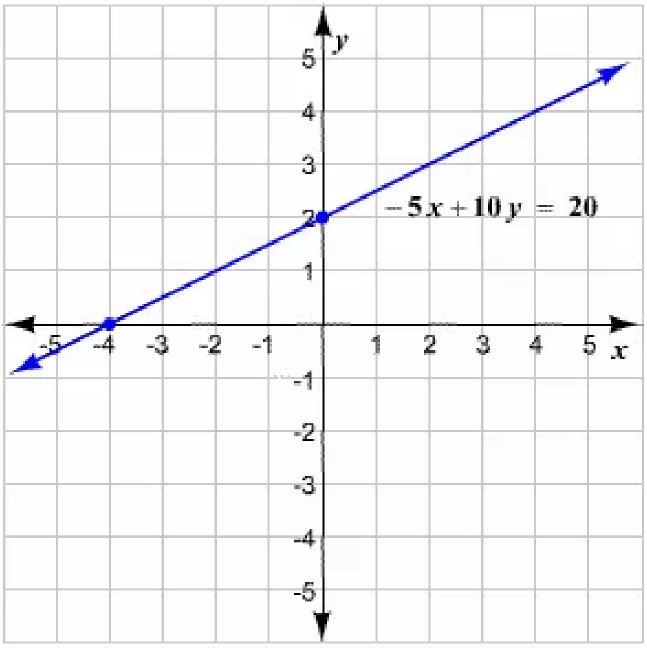
$$y = 2$$

The y-intercept of the line with the given equation is 2.

STEP 4 For graphing the given equation, first plot the intercepts on a coordinate plane.



Draw a line through the two points.



Answer 38e.

Given equation is

$$-x-y=6 \qquad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax+By=C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

$$-x-y=6$$

To identify the x-intercept putting $y=0$ in the equation (1) and solving for x.

$$-x-0=6 \qquad [\text{Let } y=0]$$

$$x=-6 \qquad [\text{Solve for } x]$$

So, the x-intercept is -6.

From the x-intercept the point is $(-6,0)$.

Again, to identify the y-intercept putting $x=0$ in the equation (1), and solving for y.

$$0-y=6 \qquad [\text{Let } x=0]$$

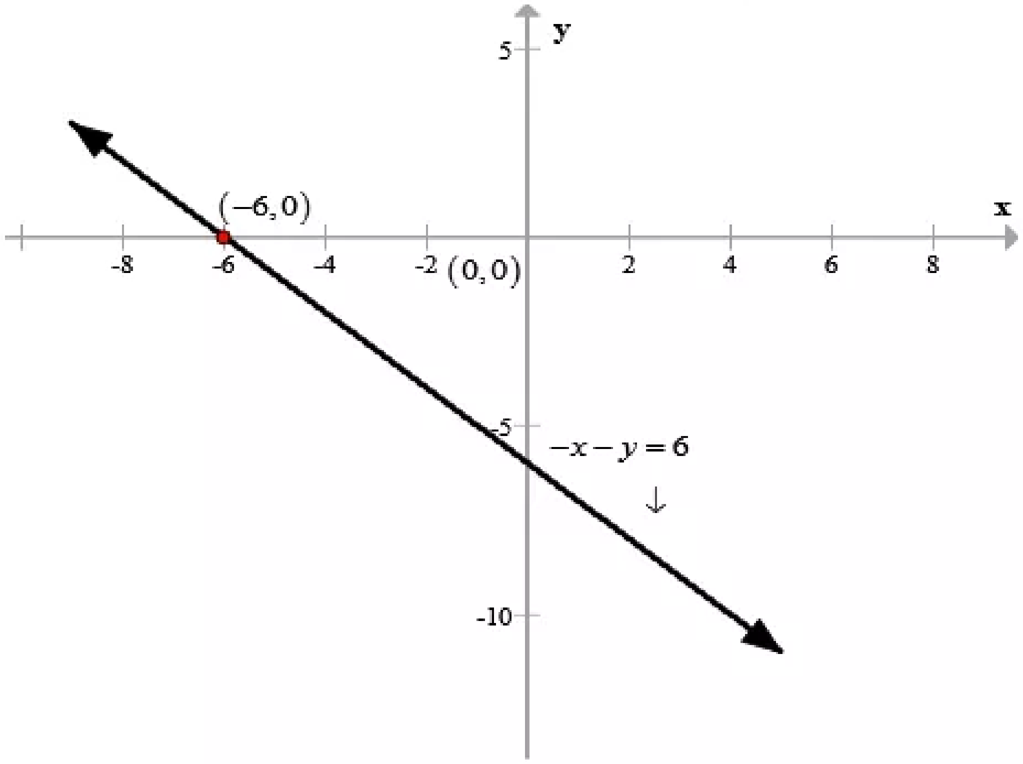
$$y=-6 \qquad [\text{Solve for } y]$$

So, the y-intercept is -6.

From the y-intercept the point is $(0,-6)$.

Therefore the x and y-intercept of the line with the equation $-x-y=6$ is -6 and -6.

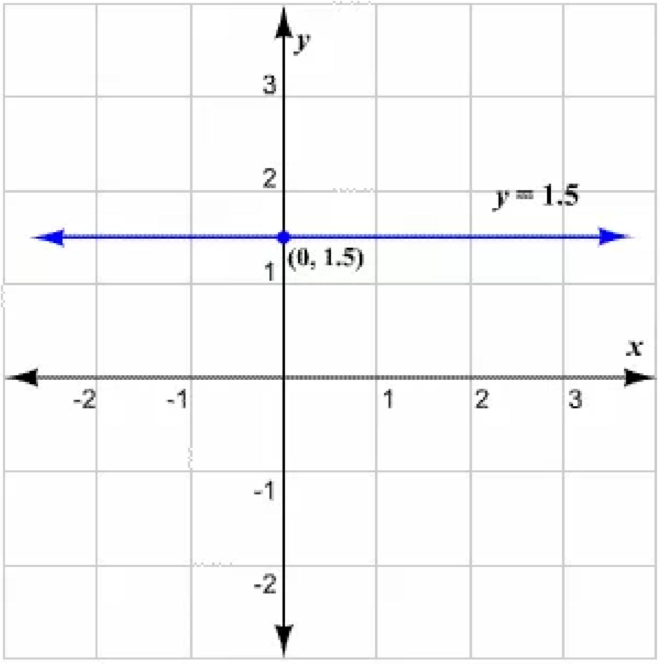
The graph of the equation $-x-y=6$ and we label x-intercept as follows:



Answer 39e.

We know that the graph of an equation of the form $y = c$ is the horizontal line through $(0, c)$, where c is the y-intercept.

Thus, for graphing the given equation, plot the intercept (0, 1.5) on a coordinate plane and draw a horizontal line through it. Every point on the line must have a y-coordinate of 1.5.



Answer 40e.

Given equation is

$$2.5x - 5y = -15 \qquad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

$$2.5x-5y=-15$$

To identify the x-intercept putting $y=0$ in the equation (1) and solving for x.

$$2.5x-5(0)=-15 \qquad [\text{Let } y=0]$$

$$x=-6 \qquad [\text{Solve for } x]$$

So, the x-intercept is -6.

From the x-intercept the point is $(-6,0)$.

Again, to identify the y-intercept putting $x=0$ in the equation (1), and solving for y.

$$2.5(0)-5y=-15 \qquad [\text{Let } x=0]$$

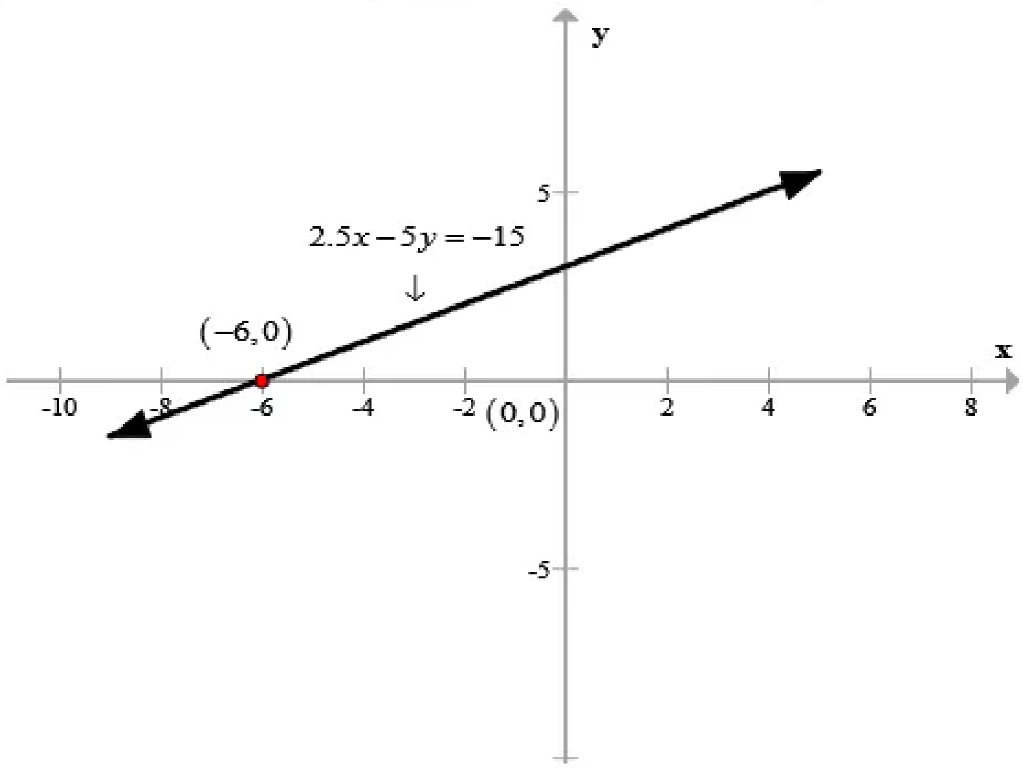
$$y=3 \qquad [\text{Solve for } y]$$

So, the y-intercept is 3.

From the y-intercept the point is $(0,3)$.

Therefore the x and y-intercept of the line with the equation $2.5x-5y=-15$ is -6 and 3.

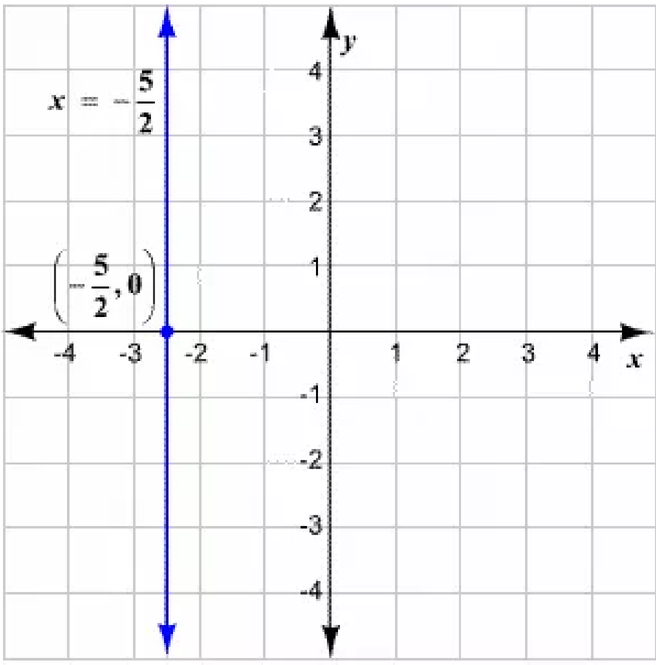
The graph of the equation $2.5x-5y=-15$ and we label x-intercept as follows:



Answer 41e.

We know that the graph of an equation of the form $x = c$ is the vertical line through $(c, 0)$, where c is the x-intercept.

Thus, for graphing the given equation, plot the intercept $\left(-\frac{5}{2}, 0\right)$ on a coordinate plane and draw a vertical line through it. Every point on the line must have an x-coordinate of $-\frac{5}{2}$.



Answer 42e.

Given equation is

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

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

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

To identify the x-intercept putting $y=0$ in the equation (1) and solving for x.

$$\frac{1}{2}x+2(0)=-2 \qquad [\text{Let } y=0]$$

$$x=-4 \qquad [\text{Solve for } x]$$

So, the x-intercept is -4.

From the x-intercept the point is $(-4,0)$.

Again, to identify the y-intercept putting $x=0$ in the equation (1), and solving for y.

$$\frac{1}{2}(0)+2y=-2 \qquad [\text{Let } x=0]$$

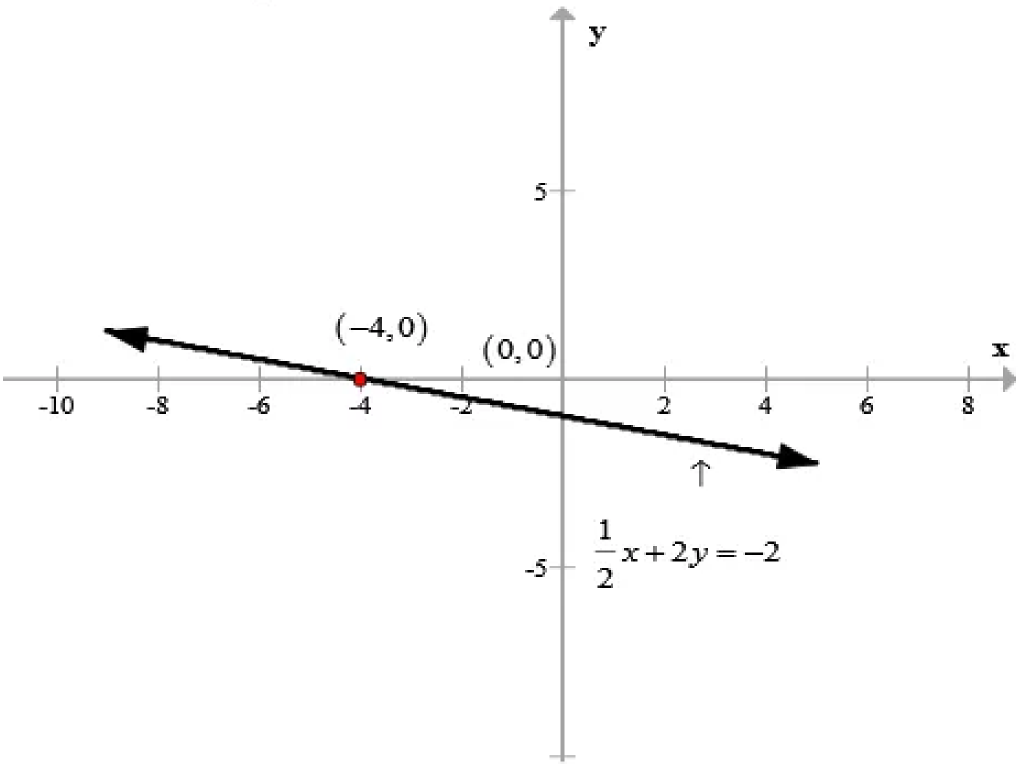
$$y=-1 \qquad [\text{Solve for } y]$$

So, the y-intercept is -1.

From the y-intercept the point is $(0,-1)$.

Therefore the x and y-intercept of the line with the equation $\frac{1}{2}x+2y=-2$ is -4 and -1.

The graph of the equation $\frac{1}{2}x+2y=-2$ and we label x-intercept as follows:



Answer 43e.

STEP 1 A linear equation of the form $Ax + By = C$, where A and B are not both zero, is said to be in standard form. Thus, the given equation is already in standard form.

STEP 2 Identify the x-intercept.

The x-coordinate of a point where a graph intersects the x-axis is the x-intercept. For finding the x-intercept, first substitute 0 for y in the equation.
$6(0) = 3x + 6$

Next, solve for x.

$$0 = 3x + 6$$
$$3x = -6$$
$$x = -2$$

Since the x-intercept is −2, the graph of the given equation crosses the x-axis at (−2, 0).

STEP 3 Identify the y-intercept.

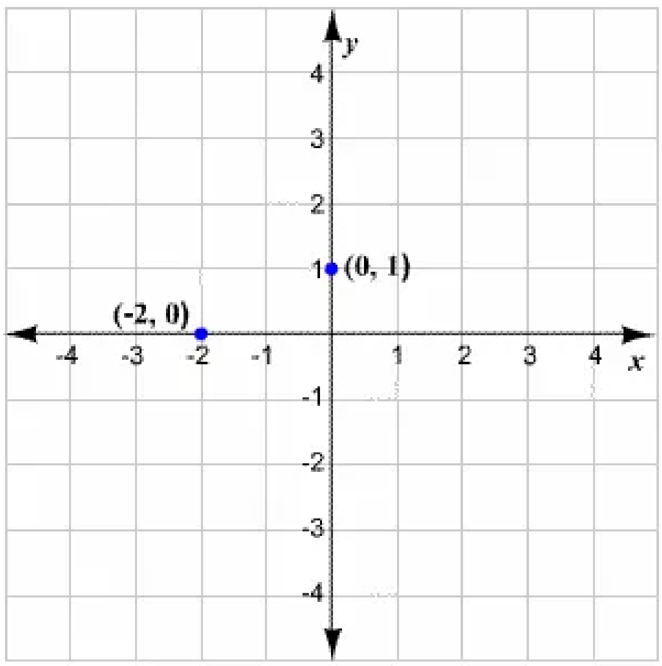
The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept. Substitute 0 for x in the equation to find the y-intercept.
$6y = 3(0) + 6$

Next, solve for y.

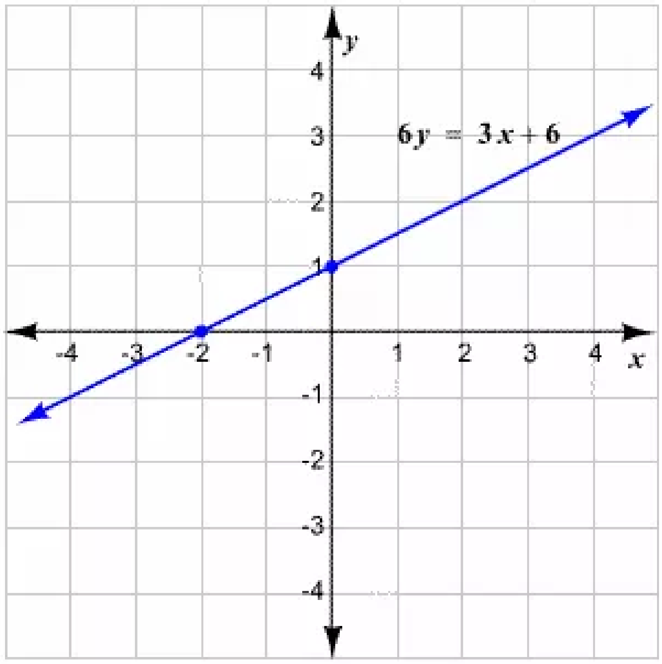
$$6y = 6$$
$$y = 1$$

The y-intercept of the line with the given equation is 1. Thus, the line crosses the y-axis at (0, 1).

STEP 4 For graphing the given equation, first plot the intercepts on a coordinate plane.



Now, draw a line through the two points.



Answer 44e.

Given equation is

$$-3+x=0 \qquad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax+By=C$$

where A,B and C are constants.

The standard form of the equation (1), we have

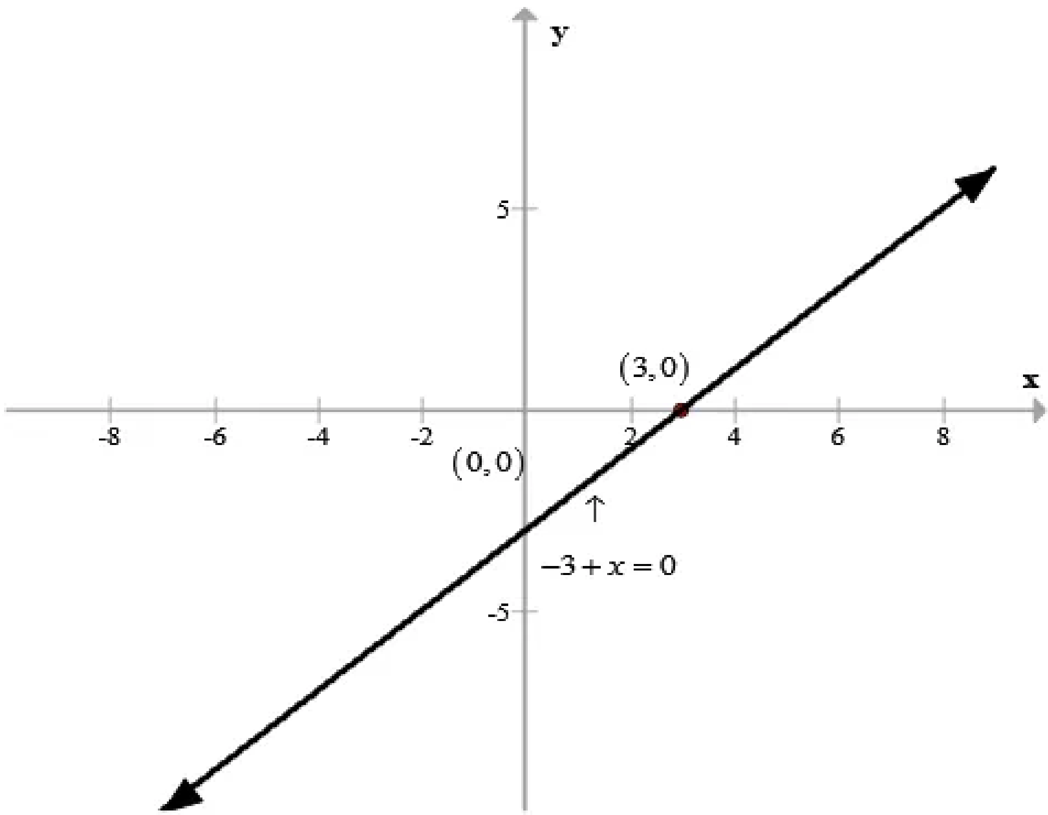
$$-3+x=0$$

$$x=3$$

The graph of $-3+x=0$ is the vertical line that passes through the point $(3,0)$.

So, every point on the line has a x -coordinate of 3.

The graph of the equation $-3+x=0$ is shown below:



This is the graph of the equation $-3+x=0$.

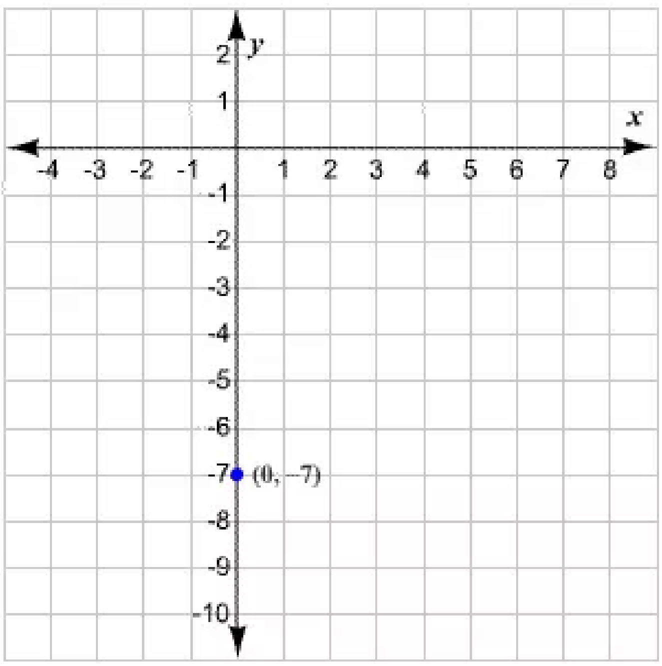
Answer 45e.

STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. Subtract 7 from both the sides to write it in slope-intercept form.

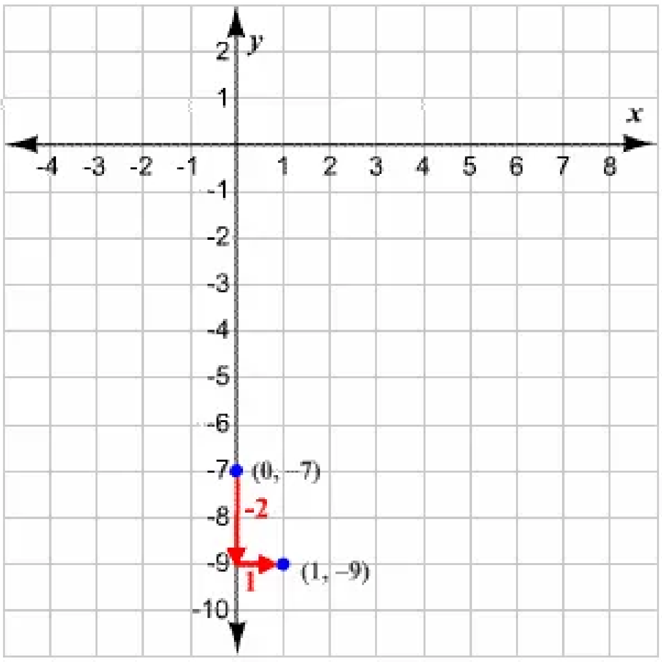
$y = -2x - 7$

On comparing the given equation with $y = mx + b$, we find that m is -2, and b is -7.

STEP 2 The y-intercept is -7. Plot the point $(0, -7)$ on a coordinate plane where the line crosses the y-axis.

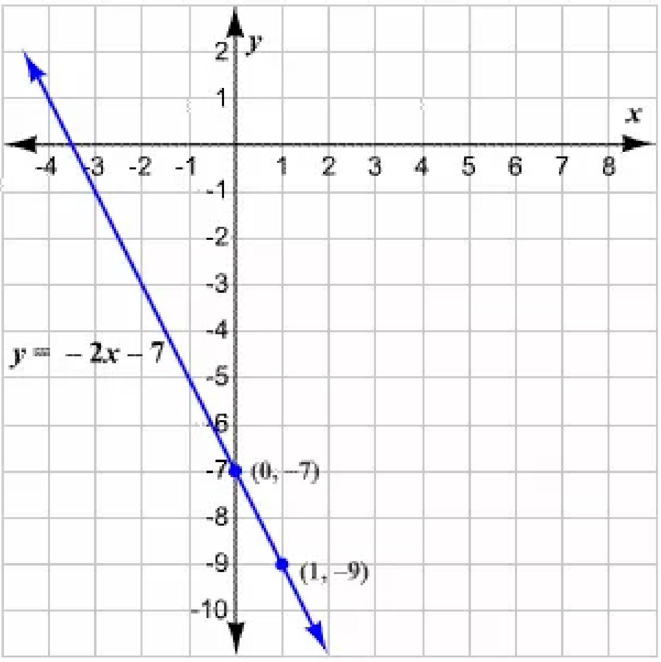


STEP 3 Use the slope to plot a second point on the line. Since the slope is –2, or $\frac{-1}{1}$, start at (0, –7) and then move down 2 units. Now, move 1 unit to the right.



The second point is (1, –9).

STEP 4 Finally, draw a line through the two points.



Answer 46e.

The given equation is

$$4y = 16$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (2), we have

$$4y = 16$$

$$y = \frac{16}{4} \qquad \text{...... (2)}$$

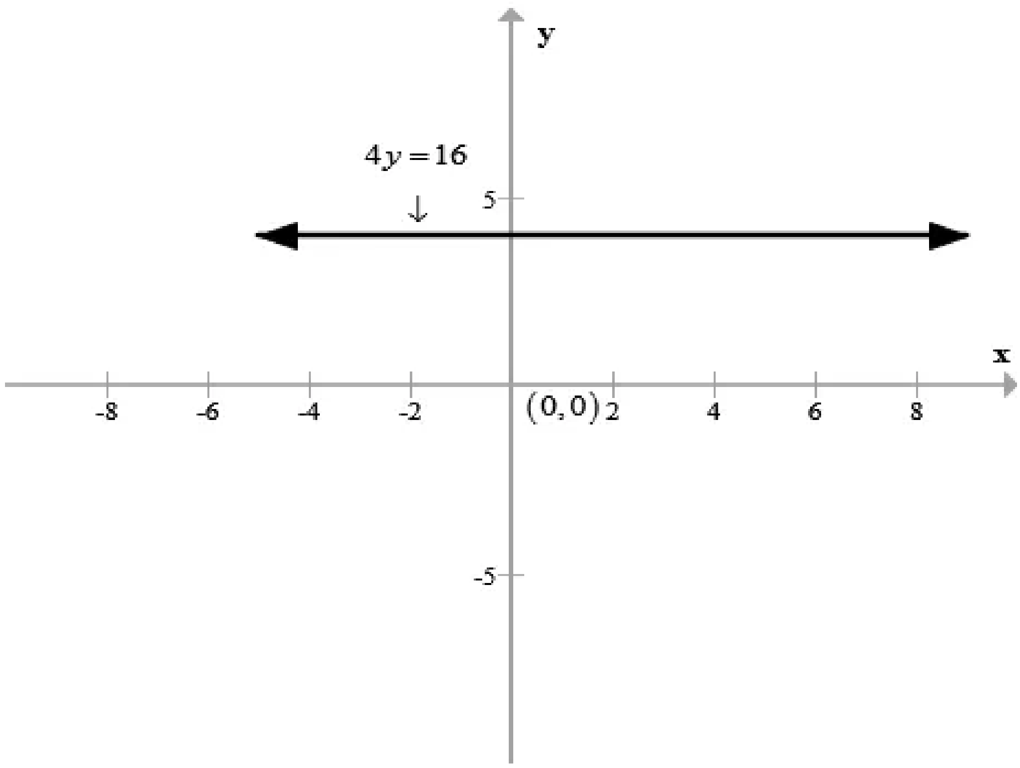
$$y = 4$$

Comparing the equation (2) with the equation (1), we have

$$m = 0, b = 4$$

The graph of (2) is a line with the slope 0 and y-intercept 4.

The graph of the equation $4y = 16$ is as follows:



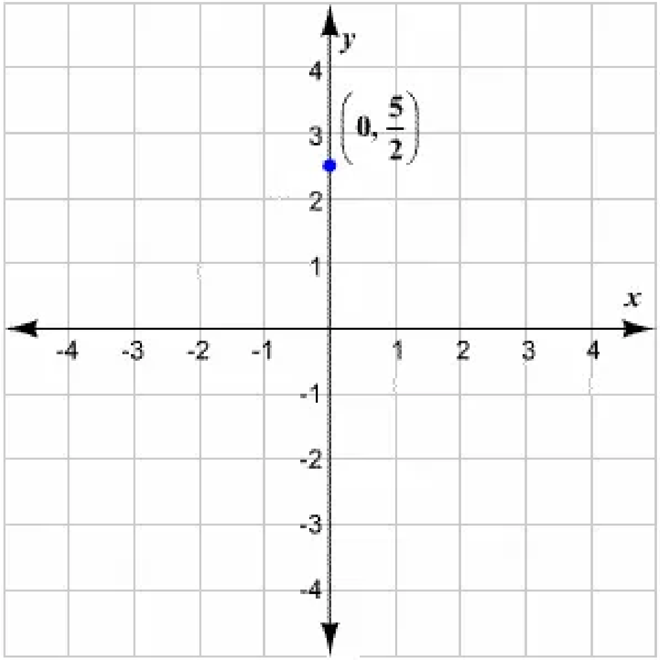
Answer 47e.

STEP 1 The slope-intercept form of a linear equation is $y = mx + b$.
Divide both the sides of the given equation by 8 to write it in slope-intercept form.

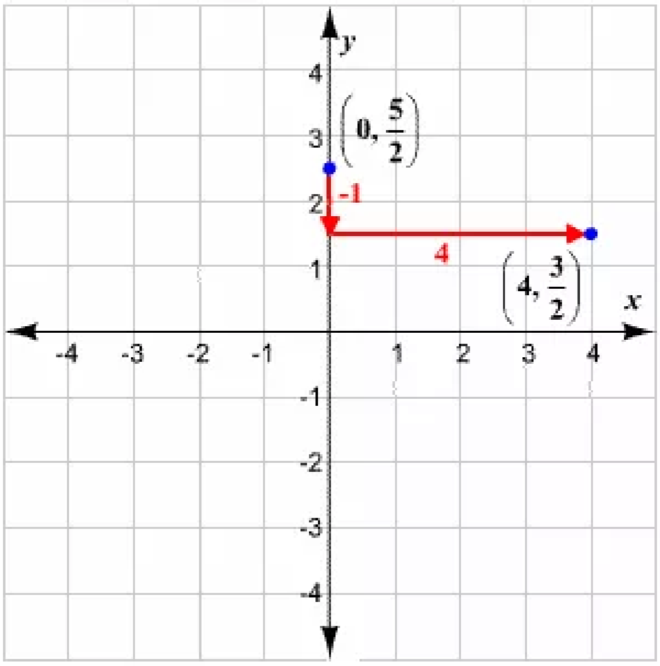
$$y = -\frac{1}{4}x + \frac{5}{2}$$

On comparing the given equation with $y = mx + b$, we find that m is $-\frac{1}{4}$, and b is $\frac{5}{2}$.

STEP 2 The y-intercept is $\frac{5}{2}$. Plot the point $\left(0, \frac{5}{2}\right)$ on a coordinate plane where the line crosses the y-axis.

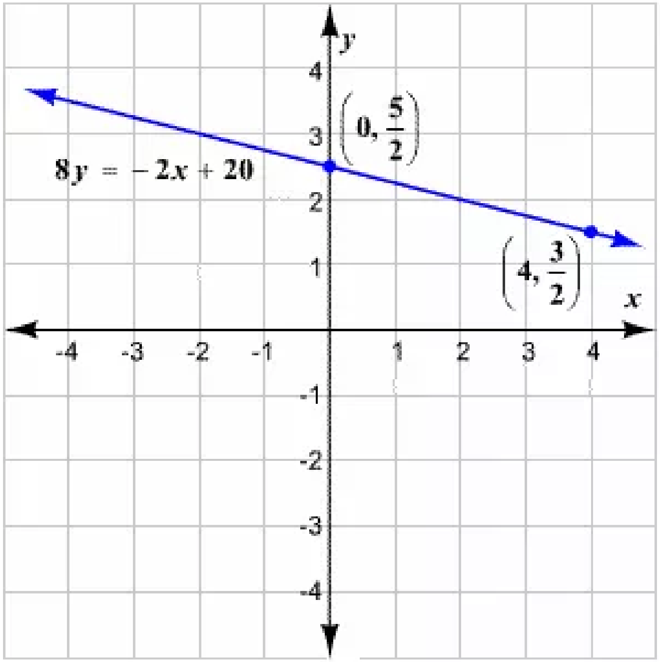


STEP 3 Use the slope to plot a second point on the line. Since the slope is $-\frac{1}{4}$, or $\frac{-1}{4}$, start at $\left(0, \frac{5}{2}\right)$ and then move 1 unit down. Next, move 4 units right.



The second point is $\left(4, \frac{3}{2}\right)$.

STEP 4 Finally, draw a line through the two points.



Answer 48e.

Given equation is

$$4x = -\frac{1}{2}y - 1 \qquad \ldots\ldots (1)$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

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

$$8x + y = -2$$

To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.

$$8x + 0 = -2 \qquad [\text{Let } y = 0]$$

$$x = -\frac{2}{8} \qquad [\text{Solve for } x]$$

$$= -0.25$$

So, the x-intercept is -0.25.

From the x-intercept the point is $(-0.25, 0)$.

Again, to identify the y-intercept putting $x = 0$ in the equation (1), and solving for y.

$$8 \cdot (0) + y = -2 \qquad [\text{Let } x = 0]$$

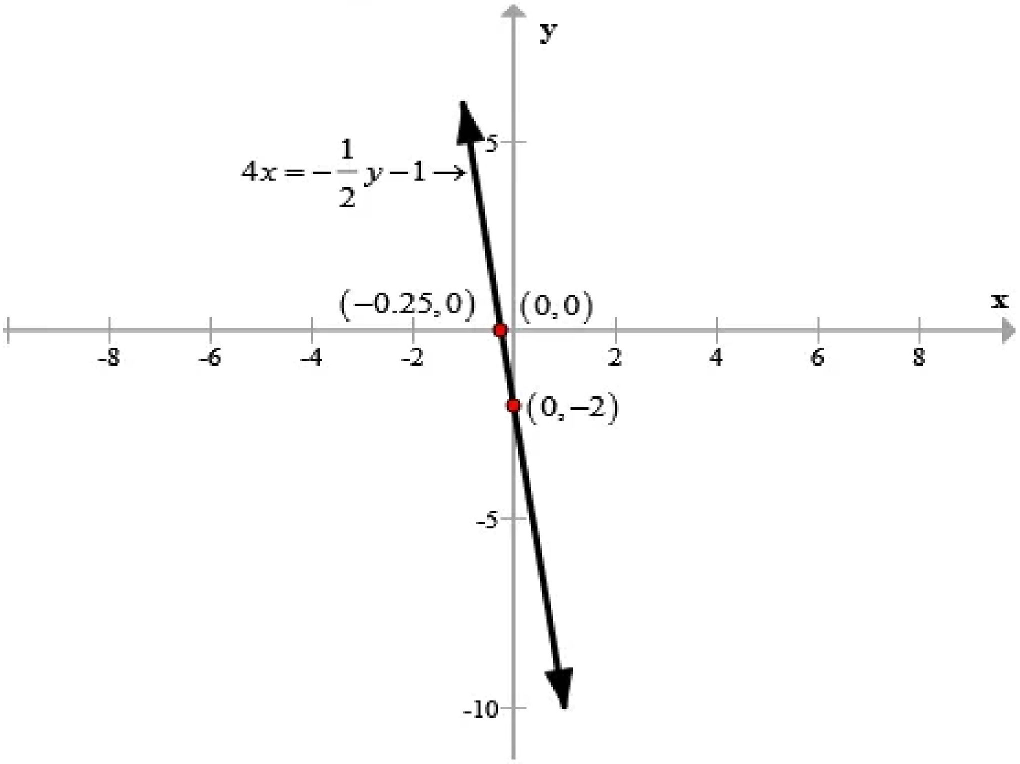
$$y = -2 \qquad [\text{Solve for } y]$$

So, the y-intercept is -2.

From the y-intercept the point is $(0, -2)$.

Therefore the x and y-intercept of the line with the equation $4x = -\frac{1}{2}y - 1$ is -0.25 and -2.

The graph of the equation $4x = -\frac{1}{2}y - 1$ is as follows:



Answer 49e.

STEP 1 A linear equation of the form $Ax + By = C$, where A and B are not both zero, is said to be in standard form. Thus, the given equation is already in standard form.

STEP 2 Identify the x-intercept.

The x-coordinate of a point where a graph intersects the x-axis is the x-intercept. For finding the x-intercept, first substitute 0 for y in the equation.

$-4x = 8(0) + 12$

Next, solve for x.

$$-4x = 0 + 12$$
$$-4x = 12$$
$$x = -3$$

Since the x-intercept is -3, the graph of the given equation crosses the x-xis at $(-3, 0)$.

STEP 3 Identify the y-intercept.

The y-coordinate of a point where a graph intersects the y-axis is called a y-intercept. Substitute 0 for x in the equation to find the y-intercept.

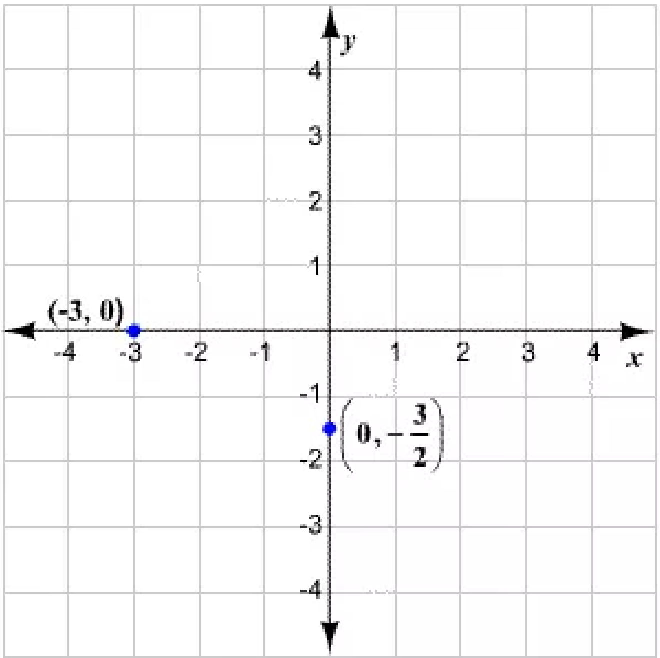
$-4(0) = 8y + 12$

Next, solve for y.

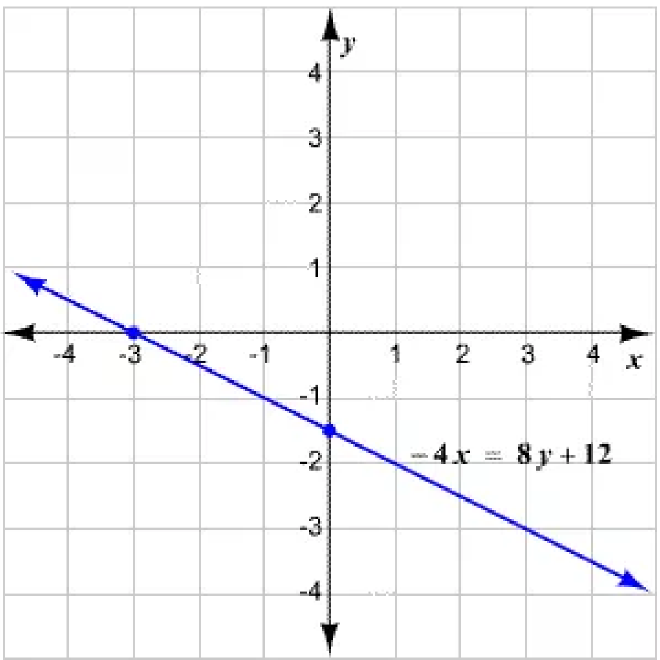
$$\begin{aligned} 0 &= 8y + 12 \\ 8y &= -12 \\ y &= -\frac{3}{2} \end{aligned}$$

The y-intercept of the line with the given equation is $-\frac{3}{2}$. Thus, the line crosses the y-axis at $\left(0, -\frac{3}{2}\right)$.

STEP 4 For graphing the given equation, first plot the points $(-3, 0)$ and $\left(0, -\frac{3}{2}\right)$ on a coordinate plane.



Now, draw a line through the two points.



Answer 50e.

Given equation is

$$3.5x = 10.5 \quad \ldots\ldots (1)$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

The standard form of the equation (1), we have

$$3.5x = 10.5$$

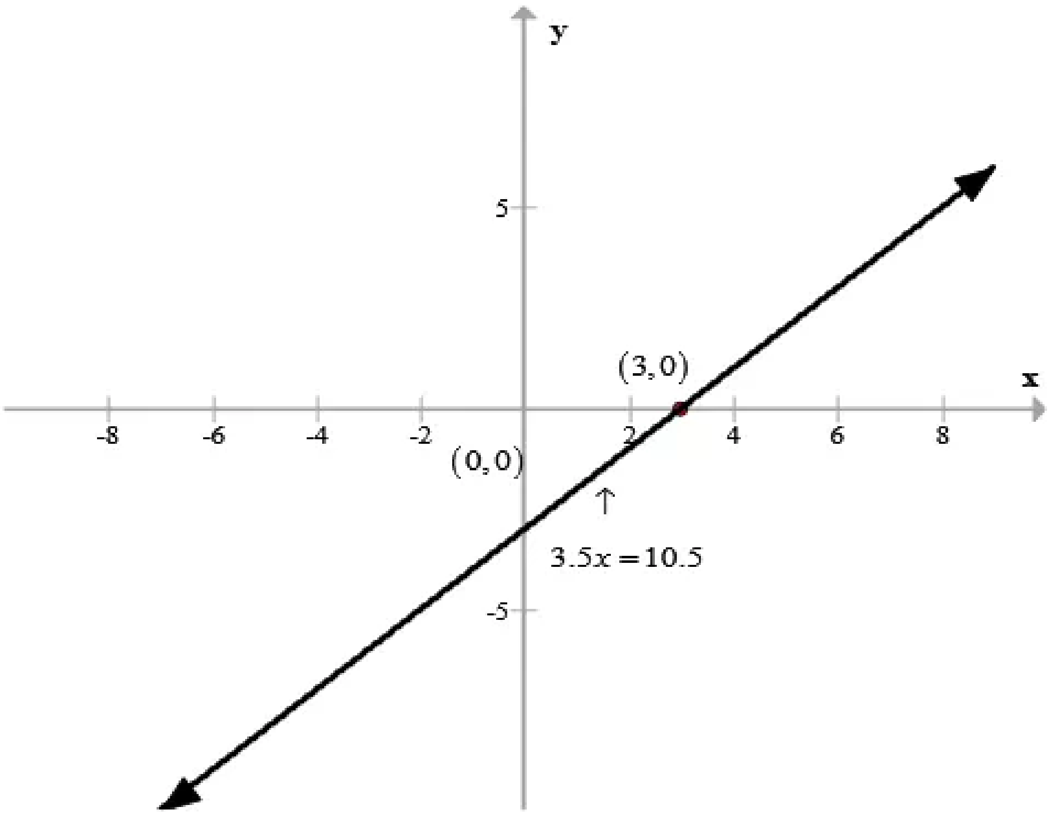
$$x = \frac{10.5}{3.5}$$

$$x = 3$$

The graph of $3.5x = 10.5$ is the vertical line that passes through the point $(3,0)$.

So, every point on the line has a x-coordinate of 3.

The graph of the equation $3.5x = 10.5$ is shown below:



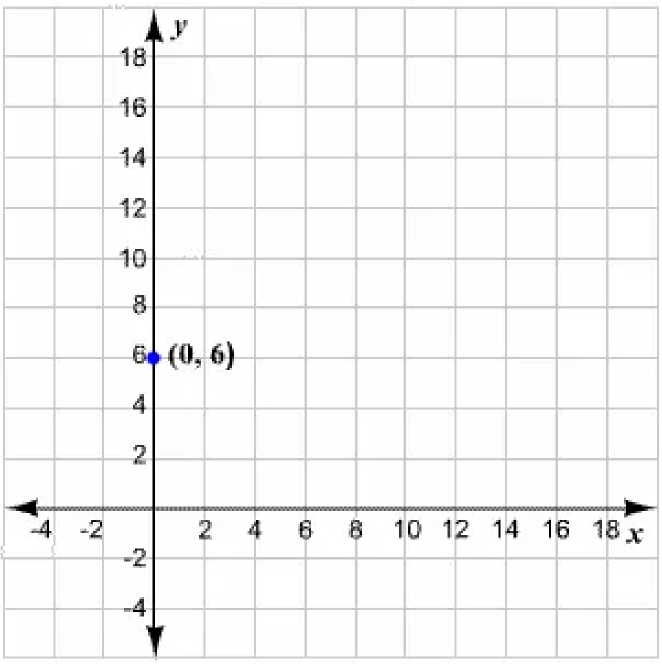
This is the graph of the equation $y = -2$.

Answer 51e.

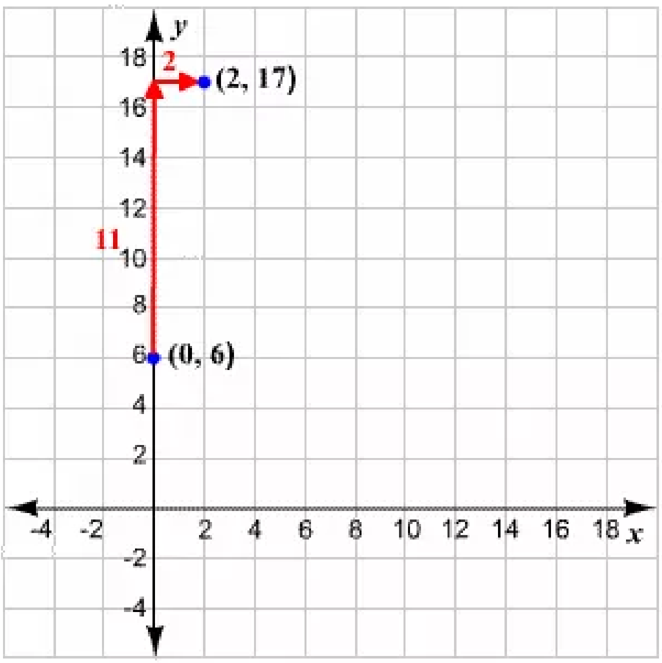
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$.
Add $5.5x$ to both the sides to write it in slope-intercept form.
$y = 5.5x + 6$

On comparing the given equation with $y = mx + b$, we find that m is 5.5, and b is 6.

STEP 2 The y-intercept is 6. Plot the point (0, 6) on a coordinate plane where the line crosses the y-axis.

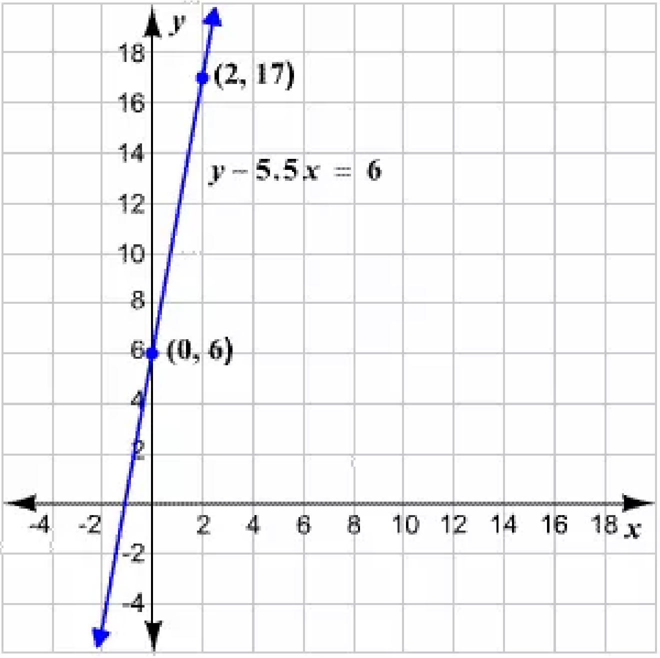


STEP 3 Use the slope to plot a second point on the line. Since the slope is 5.5, or $\frac{11}{2}$, start at (0, 6) and then move 11 units up. Now, move 2 units to the right.



The second point is (2, 17).

STEP 4 Finally, draw a line through the two points.



Answer 52e.

Given equation is

$$14 - 3x = 7y \qquad \ldots\ldots (1)$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

$$14 - 3x = 7y$$

$$-3x - 7y = -14$$

$$3x + 7y = 14$$

To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.

$$3x + 7(0) = 14 \qquad [\text{Let } y = 0]$$

$$x = \frac{14}{3} \qquad [\text{Solve for } x]$$

$$= 4.67$$

So, the x-intercept is 4.67.

From the x-intercept the point is $(4.67, 0)$.

Again, to identify the y-intercept putting $x = 0$ in the equation (1), and solving for y.

$$3(0) + 7y = 14 \qquad [\text{Let } x = 0]$$

$$y = \frac{14}{7} \qquad [\text{Solve for } y]$$

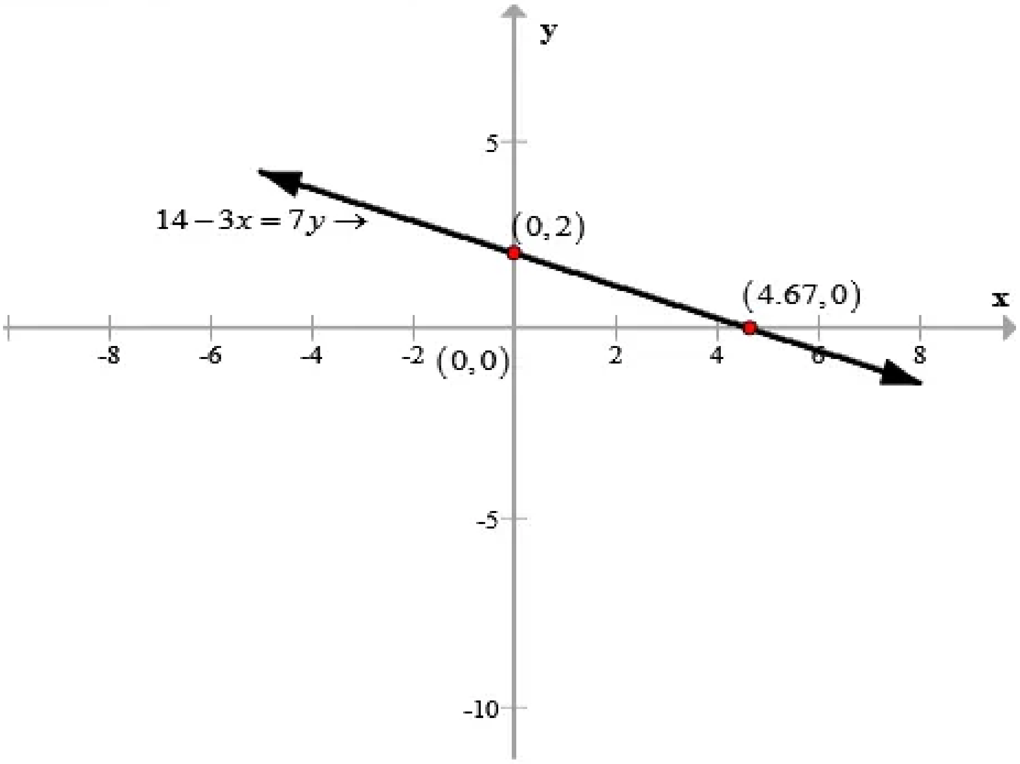
$$y = 2$$

So, the y-intercept is 2.

From the y-intercept the point is $(0, 2)$.

Therefore the x and y-intercept of the line with the equation $14 - 3x = 7y$ is 4.67 and 2.

The graph of the equation $14-3x=7y$ is as follows:



Answer 53e.

First, we have to solve the equation for y. Add 5 to both the sides.

$$2y-5+5=0+5$$

$$2y=5$$

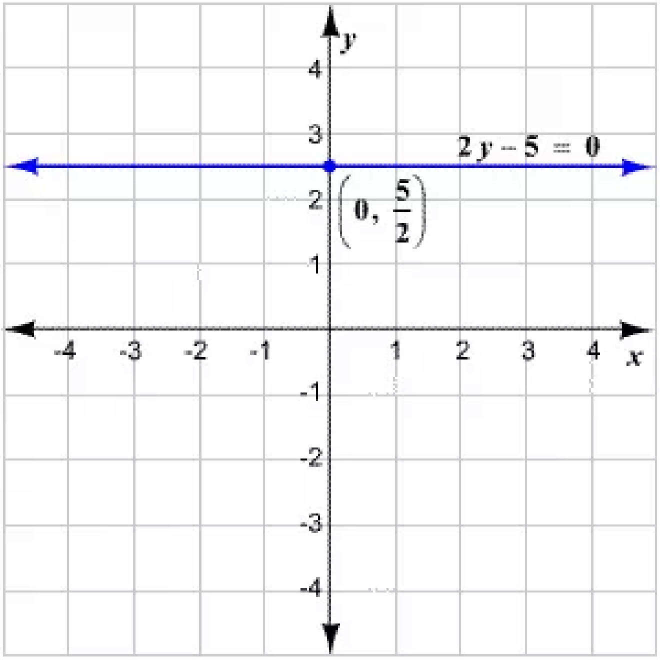
Divide both the sides by 2.

$$\frac{2y}{2}=\frac{5}{2}$$

$$y=\frac{5}{2}$$

We know that the graph of an equation of the form $y = c$ is the horizontal line through $(0, c)$, where c is the y-intercept.

Thus, for graphing the given equation, plot the intercept $\left(0, \frac{5}{2}\right)$ on a coordinate plane and draw a horizontal line through it. Every point on the line must have a y-coordinate of $\frac{5}{2}$.



Answer 54e.

Given equation is

$$5y = 7.5 - 2.5x \quad \text{...... (1)}$$

The standard form of a linear equation is

$$Ax + By = C$$

where A,B and C are constants.

Rewrite the equation (1) in standard form is

$$5y = 7.5 - 2.5x$$
$$-2.5x - 5y = -7.5$$
$$2.5x + 5y = 7.5$$

To identify the x-intercept putting $y = 0$ in the equation (1) and solving for x.

$$2.5x + 5(0) = 7.5 \quad [\text{Let } y = 0]$$
$$x = \frac{7.5}{2.5} \quad [\text{Solve for } x]$$
$$= 3$$

So, the x-intercept is 3.

From the x-intercept the point is $(3,0)$.

Again, to identify the y-intercept putting $x = 0$ in the equation (1), and solving for y.

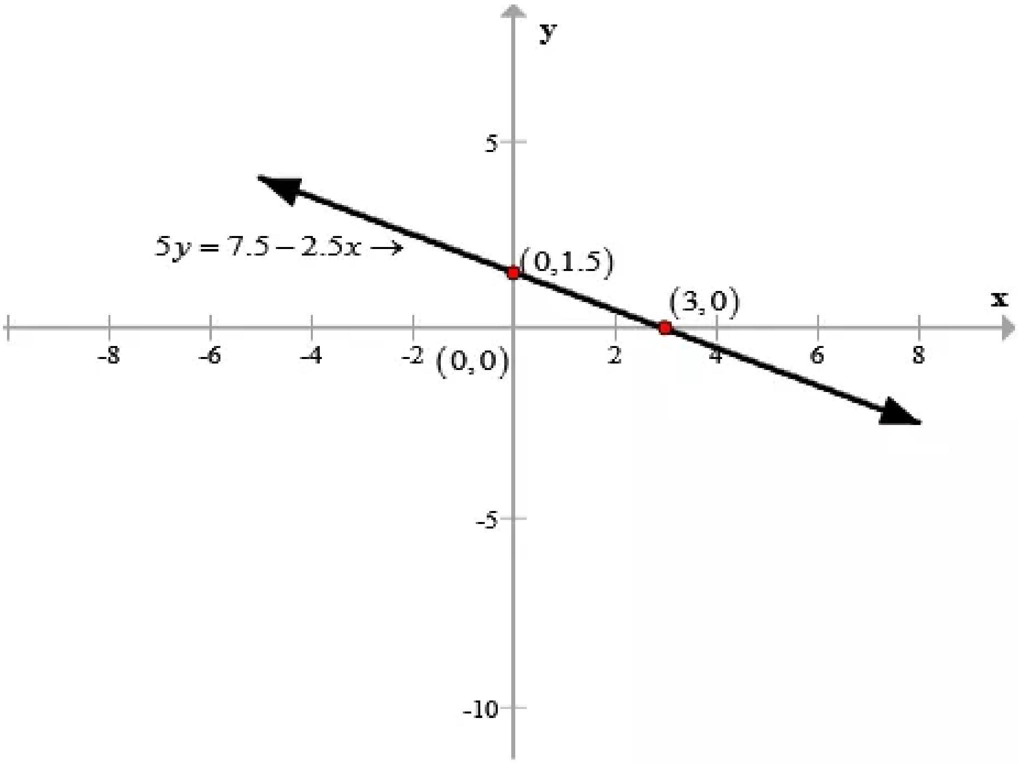
$$2.5(0) + 5y = 7.5 \quad [\text{Let } x = 0]$$
$$y = \frac{7.5}{5} \quad [\text{Solve for } y]$$
$$y = 1.5$$

So, the y-intercept is 1.5.

From the y-intercept the point is $(0,1.5)$.

Therefore the x and y-intercept of the line with the equation $5y = 7.5 - 2.5x$ is 3 and 1.5.

The graph of the equation $5y = 7.5 - 2.5x$ is as follows:



Answer 55e.

If a line has an x-intercept but no y-intercept, then it is parallel to the y-axis. Such lines are called vertical lines. The general form of a vertical line through the intercept $(c, 0)$ is $x = c$.

Thus, an equation of a line with an x-intercept but no y-intercept is $x = 3$, where $(3, 0)$ is the intercept.

Any line with a y-intercept but no x-intercept is parallel to the x-axis. We know that horizontal lines are parallel to the y-axis and so it has only x-intercept. The general form of a horizontal line through the intercept $(0, c)$ is $y = c$.

Therefore, an equation of a line with a y-intercept but no x-intercept is $y = 5$, where $(0, 5)$ is the intercept.

Answer 56e.

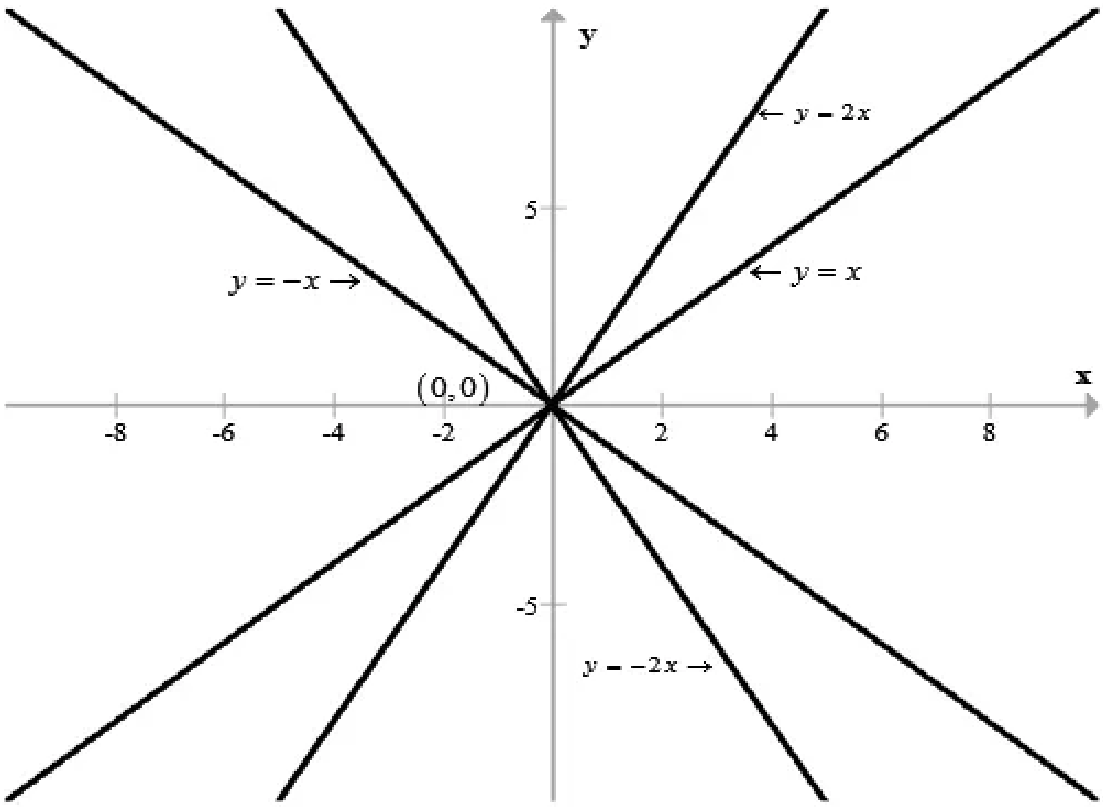
Given equation is

$$y = mx \qquad \text{...... (1)}$$

Here we need to sketch equation (1)for several values of m , both positive and negative. .Suppose, we put $m = -1, -2, 1, 2$ in equation (1), we have

$$y = -x,\ y = -2x,\ y = x,\ y = 2x$$

The sketch $y = mx$ for several values of m , both positive and negative is shown below:



Answer 57e.

First, we have to rewrite the equation in slope-intercept form. The slope intercept form a linear equation is $y = mx + b$.

Subtract Ax from both the sides of the given equation.

$$Ax + By - Ax = C - Ax$$
$$By = -Ax + C$$

Divide both the sides by B.

$$\frac{By}{B} = \frac{-Ax + C}{B}$$
$$y = -\frac{A}{B}x + \frac{C}{B}$$

Now, compare the above equation with $y = mx + b$. We get:

$$m = -\frac{A}{B}$$

and

$$b = \frac{C}{B}.$$

Thus, the slope of the graph is $-\frac{A}{B}$, and the y-intercept is $\frac{C}{B}$.

Answer 58e.

We need to prove that the slope of the line $y = mx + b$ is m.

Suppose (x_1, y_1) and (x_2, y_2) are two points on the line.

Then $m = \frac{y_2 - y_1}{x_2 - x_1}$ ......(1)

If b is the y-intercept, then by definition that menace that $(0, b)$ is a point on the line and another is the general point (x, y) then;

From equation (1), we get

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{y - b}{x - 0}$$
$$m = \frac{y - b}{x}$$
$$mx = y - b$$
$$y = mx + b.$$

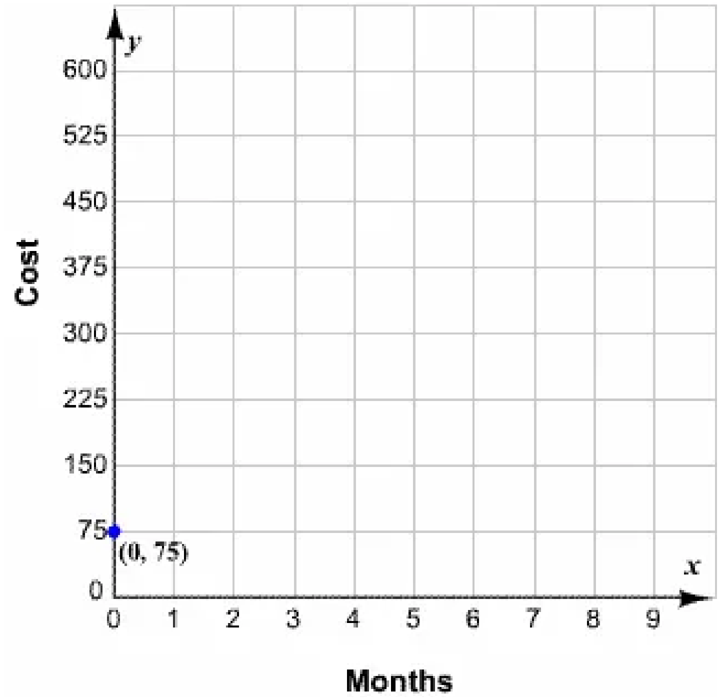
Therefore the slope of the line $y = mx + b$ is m.

Answer 59e.

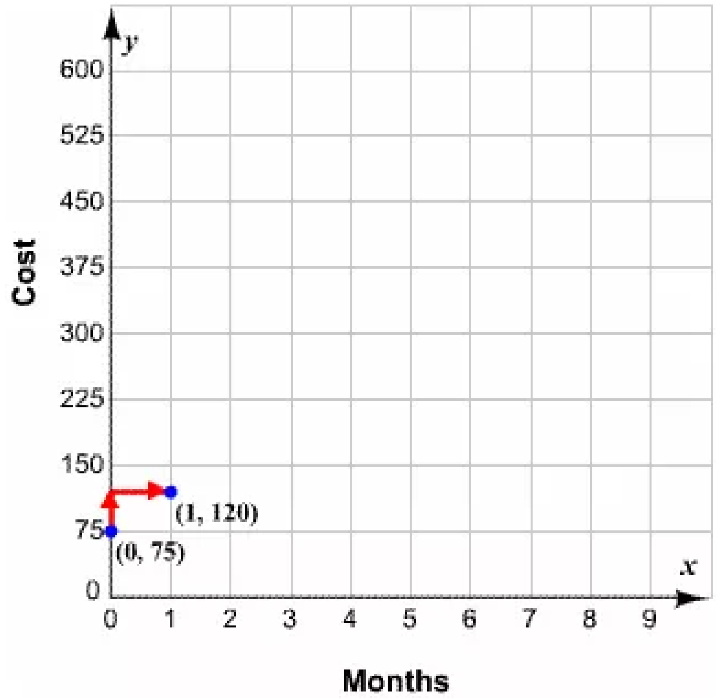
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is 45, and b is 75.

Draw a coordinate plane and label the x-axis with "Months" and the y-axis with "Cost." The y-intercept is 75. Plot the point (0, 75) on a coordinate plane where the line crosses the y-axis.

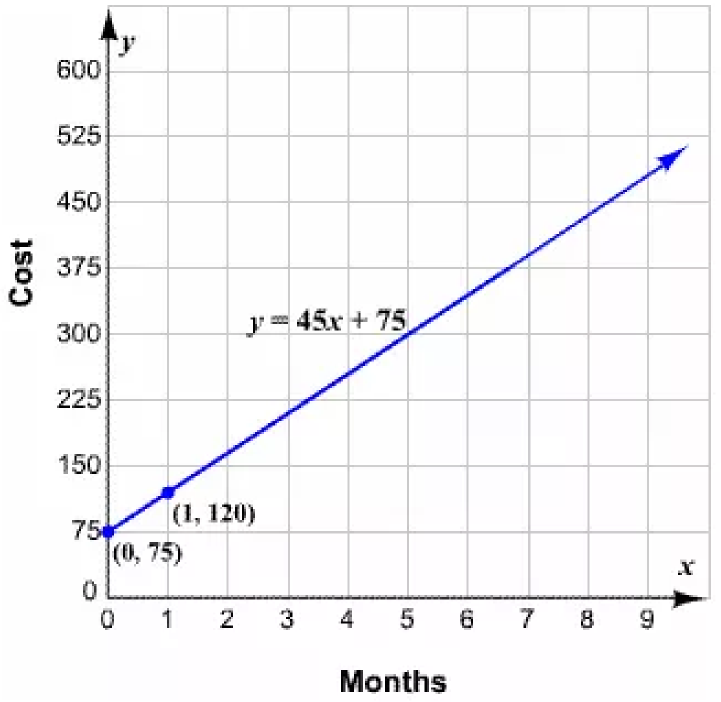


Use the slope to plot a second point on the line. Since the slope is 45, or $\frac{45}{1}$, start at (0, 75) and then move 45 units up. Now, move 1 unit to the right.

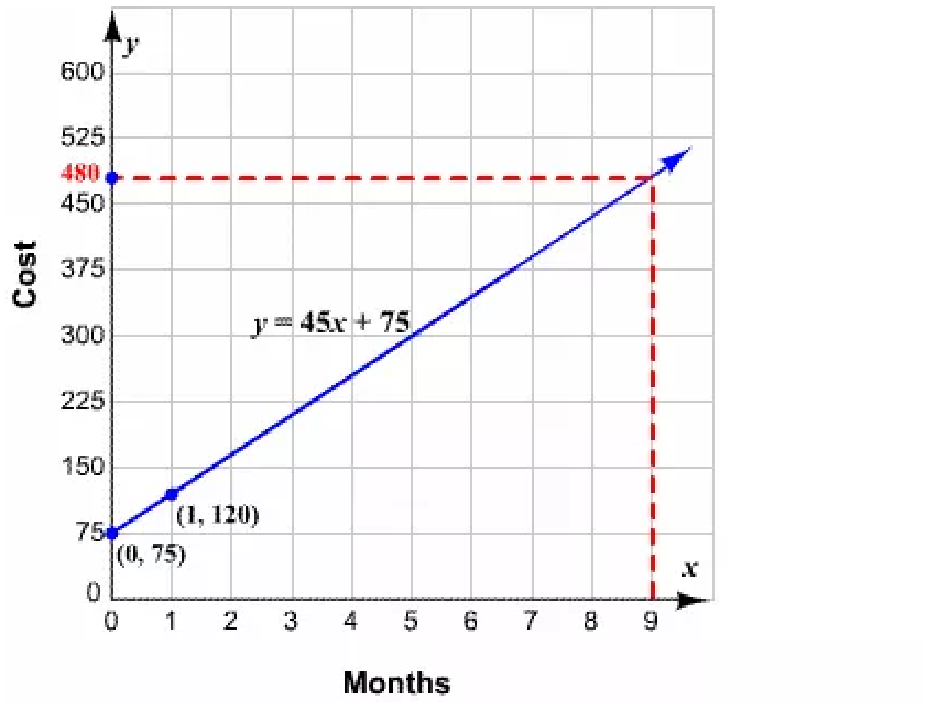


The second point is (1, 120).

Finally, draw a line through the two points.



STEP 2 For finding the total cost of the membership after 9 months, start at 9 on the x-axis and move up until you reach the graph. Then, move left to the y-axis.



After 9 months, the total cost of the membership is about $480.

Answer 60e.

Our annual membership fee to a nature society lets we camp at several campgrounds. Our total annual cost y to use camp at several campgrounds is given by

$$y = 5x + 35$$

Where x is the number of nights we camp.
The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Rewrite the given equation in the form (1), we have

$y = 5x + 35$ ...... (2)

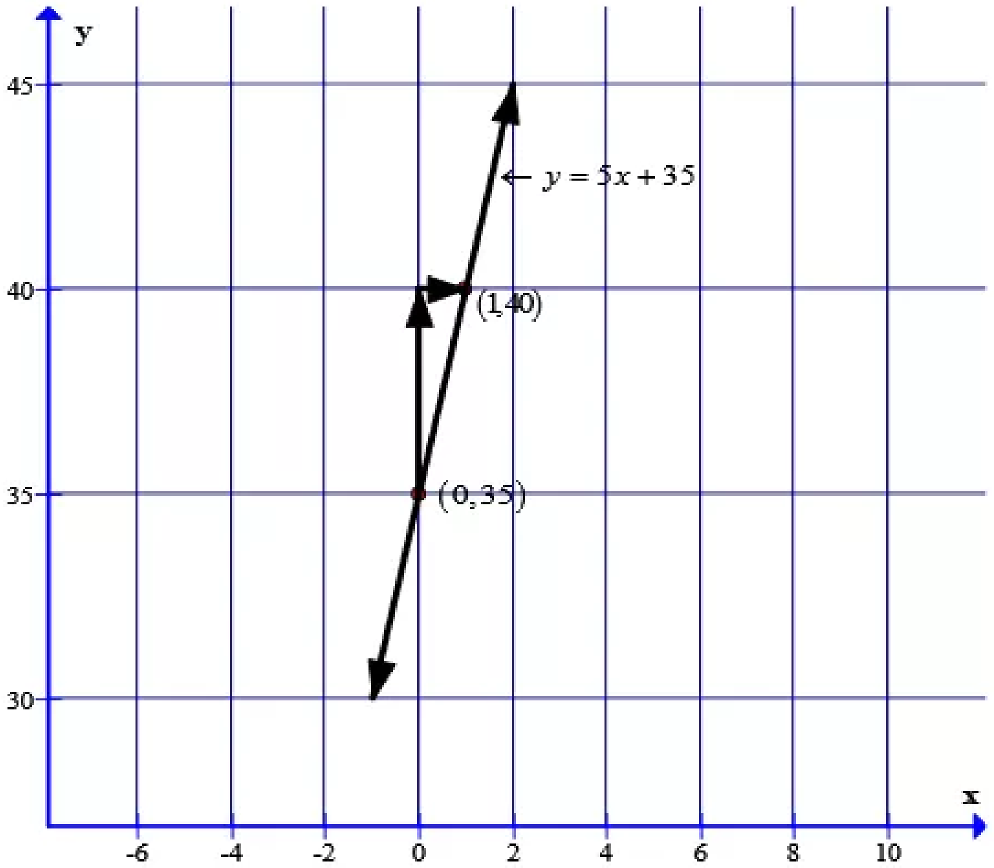
Comparing the equation (2) with the equation (1), we have

$m = 5, b = 35$

Therefore the y-intercept is 35, so the point is $(0,35)$.

Again the slope is 5 or $\frac{5}{1}$. So, we plot a second point on the line by starting at $(0,35)$ and then moving up 5 units and right 1 unit. The second point is $(1,40)$.

The graph of the equation $y = 5x + 35$ is shown below:

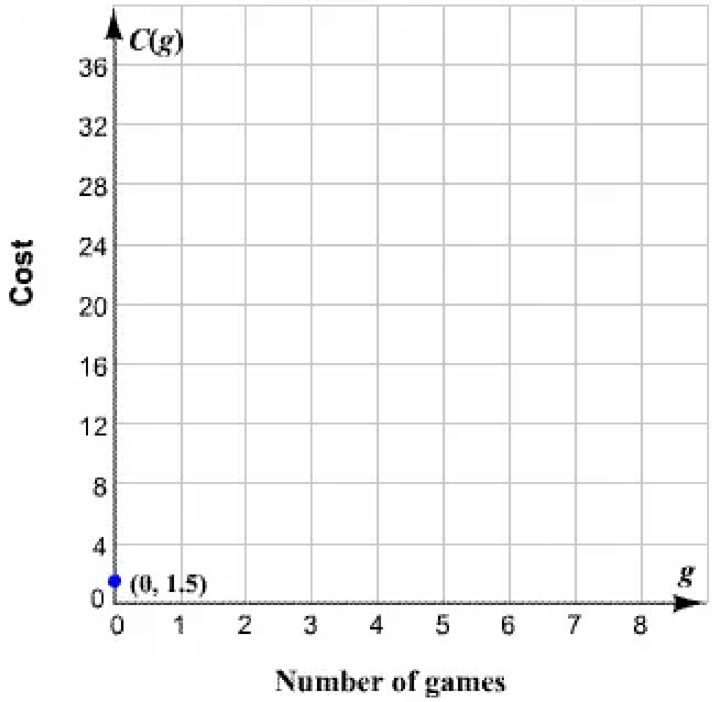


Answer 61e.

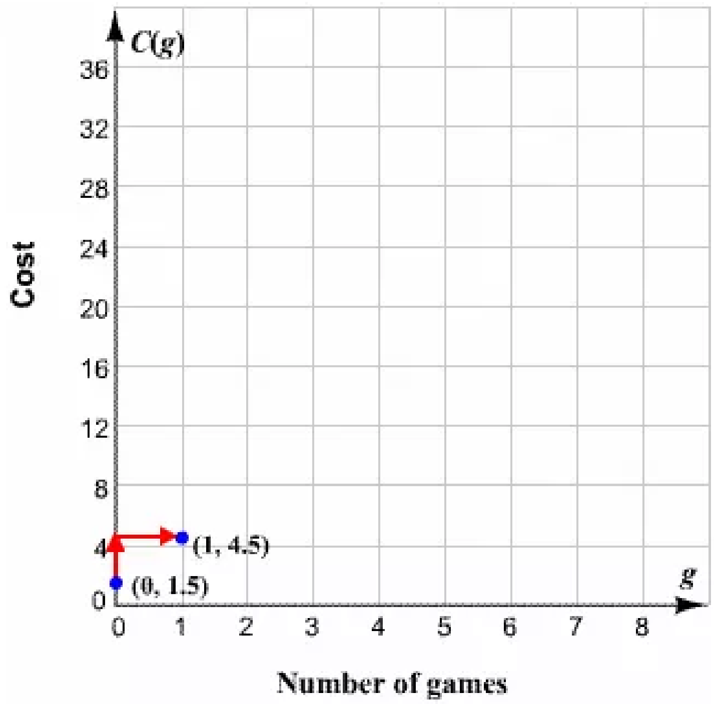
STEP 1 The slope-intercept form of a linear equation is $y = mx + b$. The given equation is already in the slope-intercept form.

On comparing the given equation with $y = mx + b$, we find that m is 3, and b is 1.5.

Draw a coordinate plane and label the x-axis with "Number of games" and the y-axis with "Cost." The y-intercept is 1.5. Plot the point (0, 1.5) on a coordinate plane where the line crosses the y-axis.

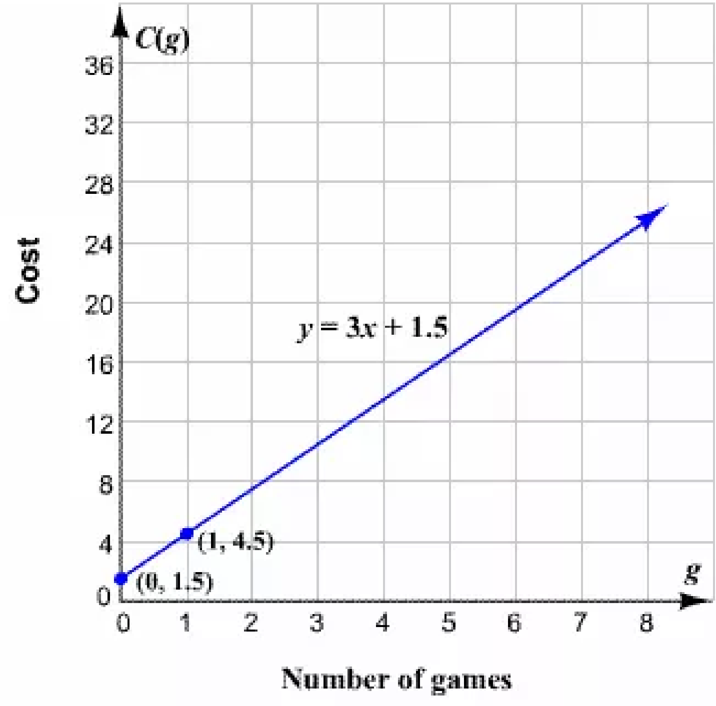


Use the slope to plot a second point on the line. Since the slope is 3, or $\frac{3}{1}$, start at (0, 1.5) and then move 3 units up. Now, move 1 unit to the right.



The second point is (1, 4.5).

Finally, draw a line through the two points.



STEP 2 In a real-life context, the y-intercept often represents an initial value. Thus, the cost to rent shoes is the y-intercept of the line, which is \$1.50.

STEP 3 We know that a line's slope can represent an average rate of change in a real-life context. Therefore, the cost per game is the slope of the line, which is \$3.

Answer 62e.

We purchase a 300 minute phone card. The function model

$$M(w) = -30w + 300 \qquad \ldots\ldots (1)$$

Where M is the number of minutes that remain on the card after w weeks.
The standard form of a linear equation is

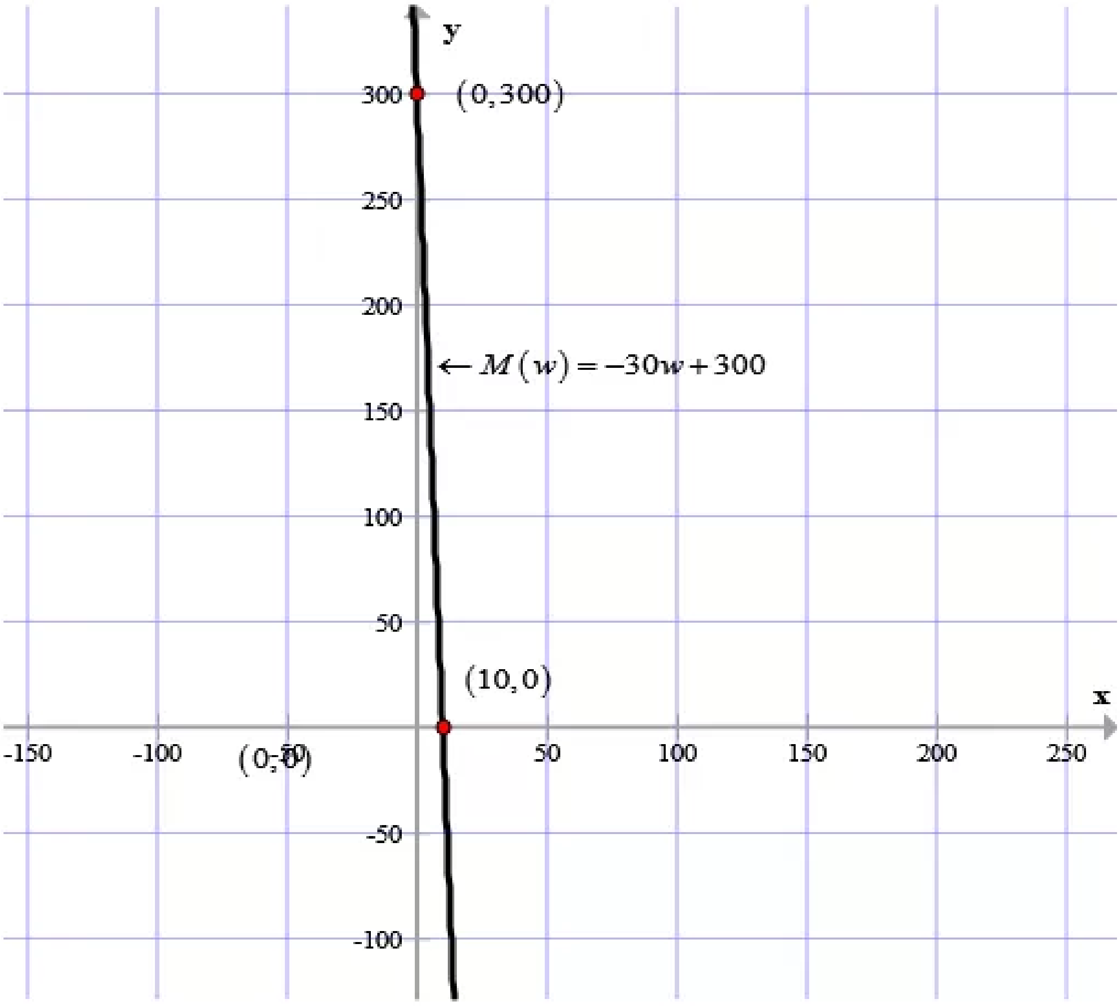
$$Ax + By = C$$

where A,B and C are constants.

Rewrite the equation (1), in standard form is

$$M(w) + 30w = 300$$

Therefore the graph of the equation (1) is shown below:



Since M and w are positive,
Therefore the reasonable domain is: 0 to 10
The reasonable range is: 0 to 300

Here $w = 7$
From equation (1), we have

$$\begin{aligned} M(w) &= -30w + 300 \\ &= -30 \cdot 7 + 300 \\ &= -210 + 300 \\ &= 90 \text{ minute} \end{aligned}$$

Therefore we use the card per week is $\boxed{90 \text{ minute}}$

Answer 63e.

In a real-life context, the y-intercept often represents an initial value. The value of the card at the beginning is \$30. Thus, the y-intercept of the graph will be 30.

After you buy each smoothie, the value of the card will decrease. This means that as x increases, y decreases. Therefore, the line will fall from left to right.

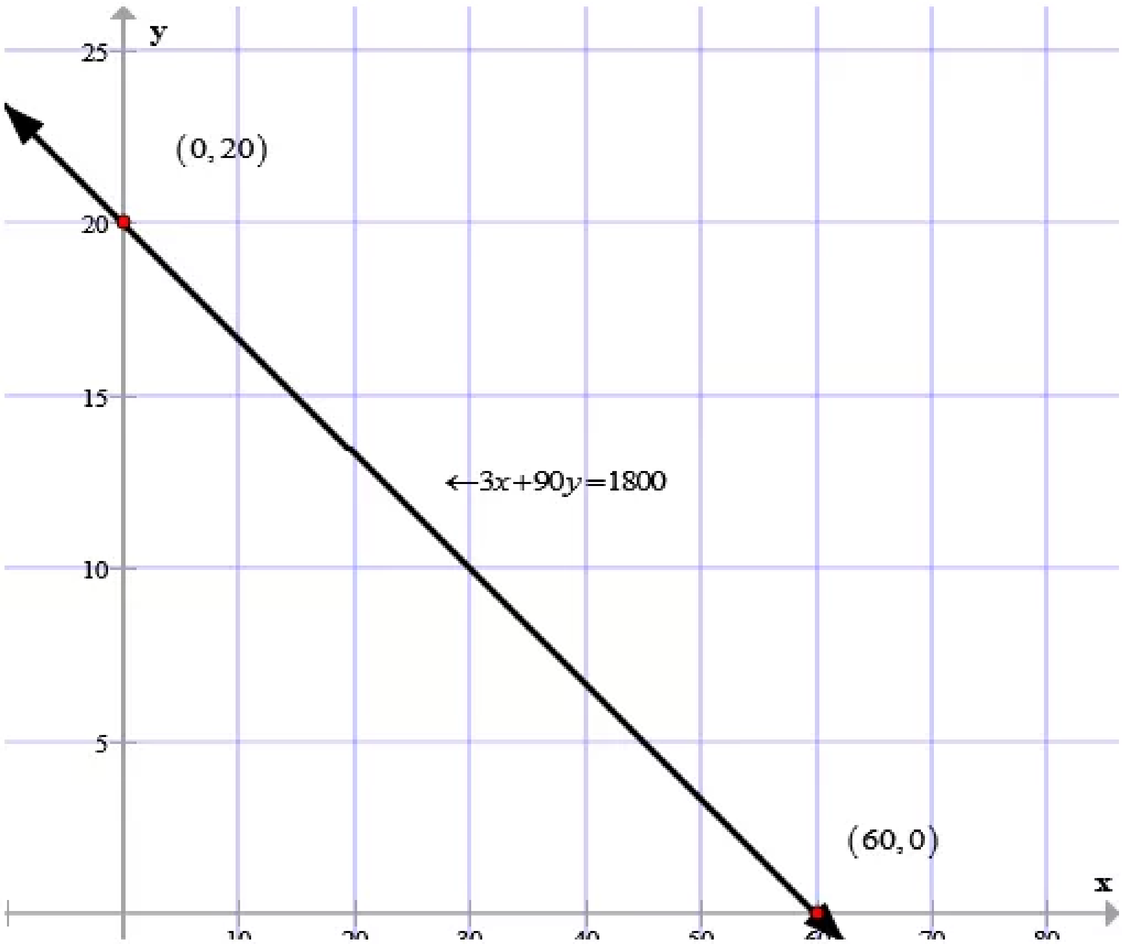
Answer 64e.

I and a friend Kayak 1800 yards down a river. I draft with the current partway at 30 yards Per minute and paddle partway at 90 yards per minute. the trip is modeled by

$$30x+90y=1800 \qquad \text{...... (1)}$$

where x is the drifting time and y is the paddling time.

Therefore the graph of the equation (1) is shown below:



Since x and y are positive,

Therefore the reasonable domain is: 0 to 60

The reasonable range is: 0 to 20

The x-intercept represent $y=0$, that menace at that time the drafting time is 0.

The y-intercept represent $x=0$, that menace at that time the paddling time is 0.

(b)
If we paddle for 5 minutes,
Then from equation (1), we have

$$30x+90y=1800$$
$$30x+90\cdot 5=1800$$
$$x=45$$

Therefore the total trip time is ,

$$x+y$$
$$=45+5$$
$$\boxed{=50 \text{ munite}}$$

(c)
If we paddle and drift equal amount of time then $x=y$.
So, from equation (1), we have

$$30x+90y=1800$$
$$30x+90x=1800$$
$$120x=1800$$
$$x=15$$

Therefore $x=y=15$

So, the total trip time is $x+y=15+15=\boxed{30 \text{ minute}}$

Answer 65e.

Step 1: The given equation is already in standard form. First, we have to find the intercepts to graph the equation.

For finding the r-intercept, first substitute 0 for w in the equation.
$6r+3.5(0)=14$

Next, solve for r.

$$6r = 14$$
$$r = \frac{7}{3}$$

Since the r-intercept is $\frac{7}{3}$, the graph of the given equation crosses the vertical axis at $\left(\frac{7}{3}, 0\right)$.

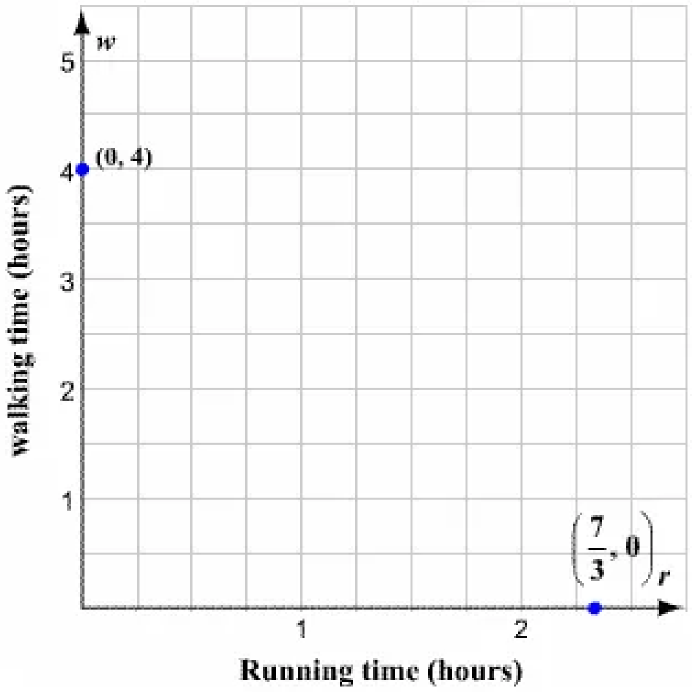
Substitute 0 for r in the equation to find the w-intercept.
$6(0)+3.5w=14$

Solve for w.

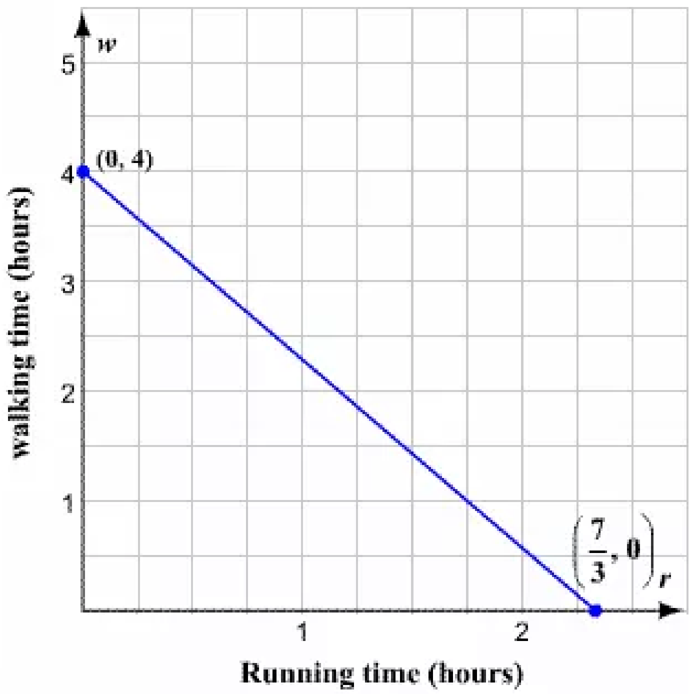
$$3.5w = 14$$
$$w = 4$$

The w-intercept of the line with the given equation is 4. Thus, the line crosses the horizontal axis at (0, 4).

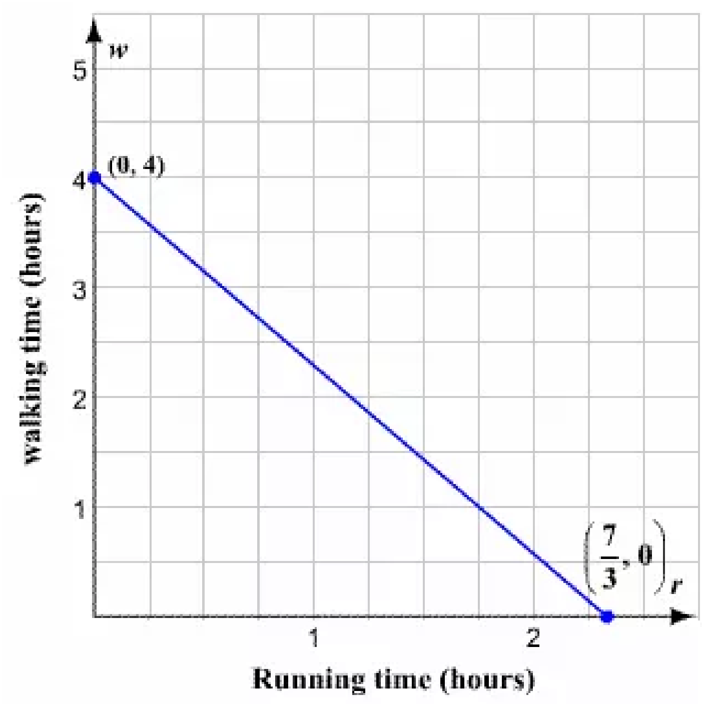
Now, draw a coordinate plane and label the vertical axis as "Running time (hours)" and the horizontal axis as "Walking time (hours)". Plot the points $\left(\frac{7}{3}, 0\right)$ and $(0, 4)$ on the coordinate plane.



Finally, join the two points using a line segment.



Step 2: Any point on the line is a possible combination of running and walking times.



From the figure, we can see that three possible combinations of running and walking times are $r = 0$ and $w = 4$, $r = 1.75$ and $w = 1$, and $r = 0.875$ and $w = 2.5$.

Answer 66e.

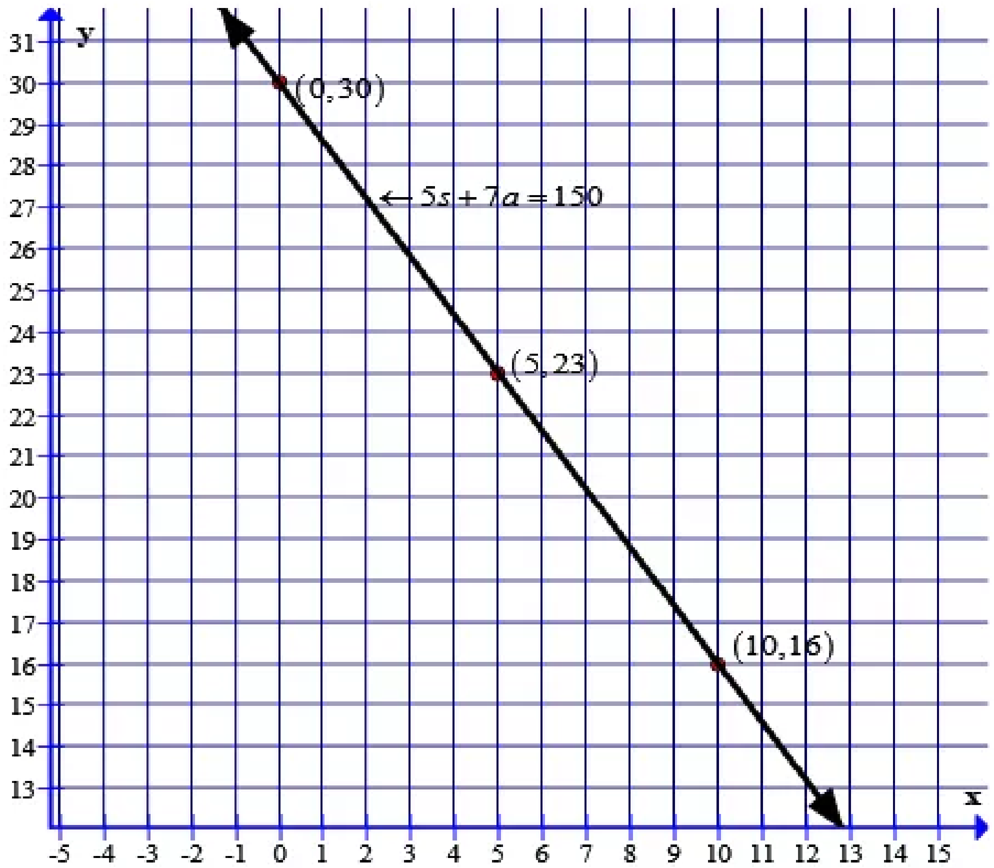
An honor society has \$150 to buy science museum and art museum tickets for student awards. The numbers of tickets that can be bought are given by

$$5s + 7a = 150 \qquad \text{...... (1)}$$

where s is the number of science museum tickets and a is the art museum tickets.

The equation (1) is linear. Therefore the equation (1) represents a line.
Putting $a = 0, 5$ we have $s = 30, 23$

The graph of the equation $5s+7a=150$ is shown below:



From the graph we see that all the possible combination are in the 1st quadrant.
Therefore first possible combination of ticket that use all \$150 is
The number of science museum tickets is 30 and the number of art museum tickets is 0.
And second possible combination of ticket that use all \$150 is
The number of science museum ticket is 23 and the number of art museum tickets is 5.

Answer 67e.

a) It is given that the balloon is initially 200 feet above the ground. Thus, at time t = 0, the value of h is 200.

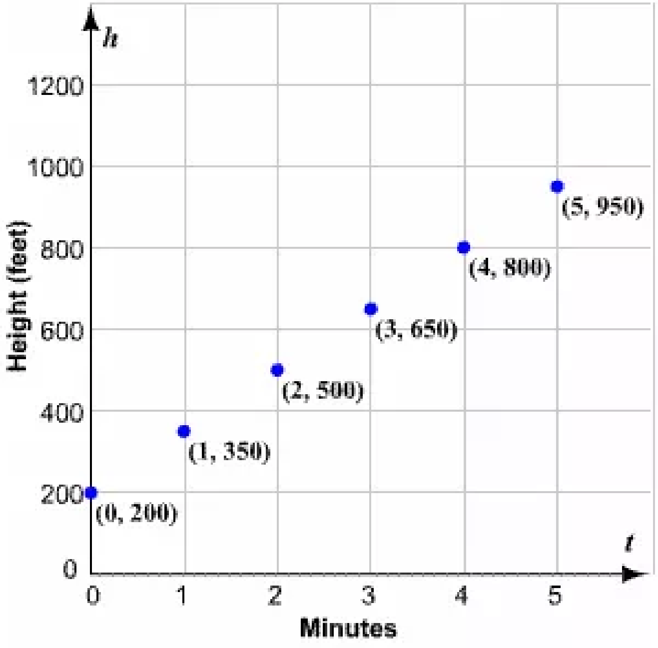
After each minute, the value of h gets increased by 150.
At $t = 1$, $h = 200 + 150 = 350$.
At $t = 2$, $h = 350 + 150 = 500$.

Organize the results in a table as shown.

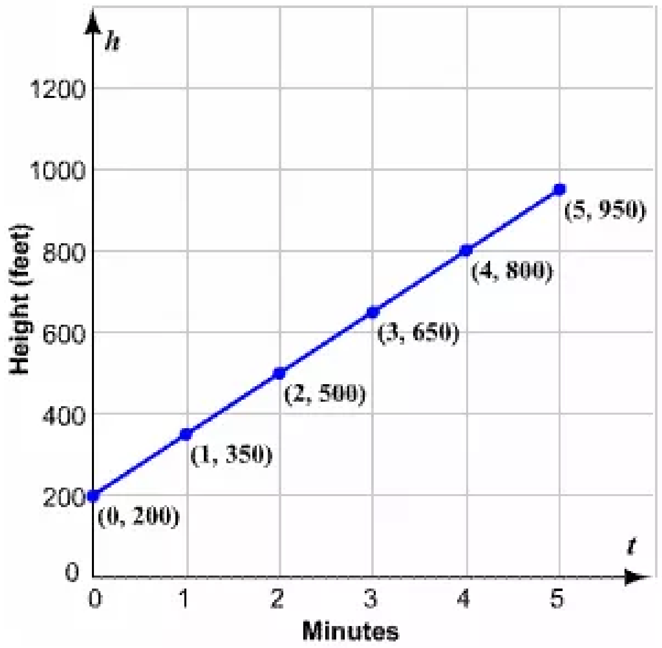
t (minutes)	h (feet)
0	200
1	350
2	500
3	650
4	800
5	950

b) The points from the table are (0, 200), (1, 350), (2, 500), (3, 650), (4, 800), and (5, 950).

Draw a coordinate plane and label the horizontal axis with "Minutes" and the vertical axis with "Height (feet)." Plot the points on the coordinate plane.



Now, connect the points with a line segment.



c) After t minutes, the balloon's height h is the initial height, 200, plus the product of the ascent rate, 150, and the time.

Therefore, an equation representing the problem is,
$h = 200 + 150t$.

Answer 68e.

Me and a friend are typing our research papers on computers. The function is

$$y = 1400 - 50x \quad \text{...... (1)}$$

where y is the number of words I have left to type after x minutes.

For my friend,

$$y = 1200 - 50x \quad \text{...... (2)}$$

where y is the number of words I have left to type after x minutes.

The slope intercept of the equation of a line is

$$y = mx + b \quad \text{...... (3)}$$

where m be the slope of the line and b be the y-intercept.

(a)

Rewrite the equation (1) in the form (3), we have

$$y = 1400 - 50x$$

$$y = (-50)x + 1400 \quad \text{...... (4)}$$

Comparing the equation (4) with the equation (3), we have

$$m = -50, b = 1400$$

Therefore the slope of the equation (1), we have

$$m = -50$$

Again , rewrite the equation (2) in the form (3), we have

$$y = 1200 - 50x$$

$$y = (-50)x + 1200 \quad \text{...... (5)}$$

Comparing the equation (5) with the equation (3), we have

$$m = -50, b = 1200$$

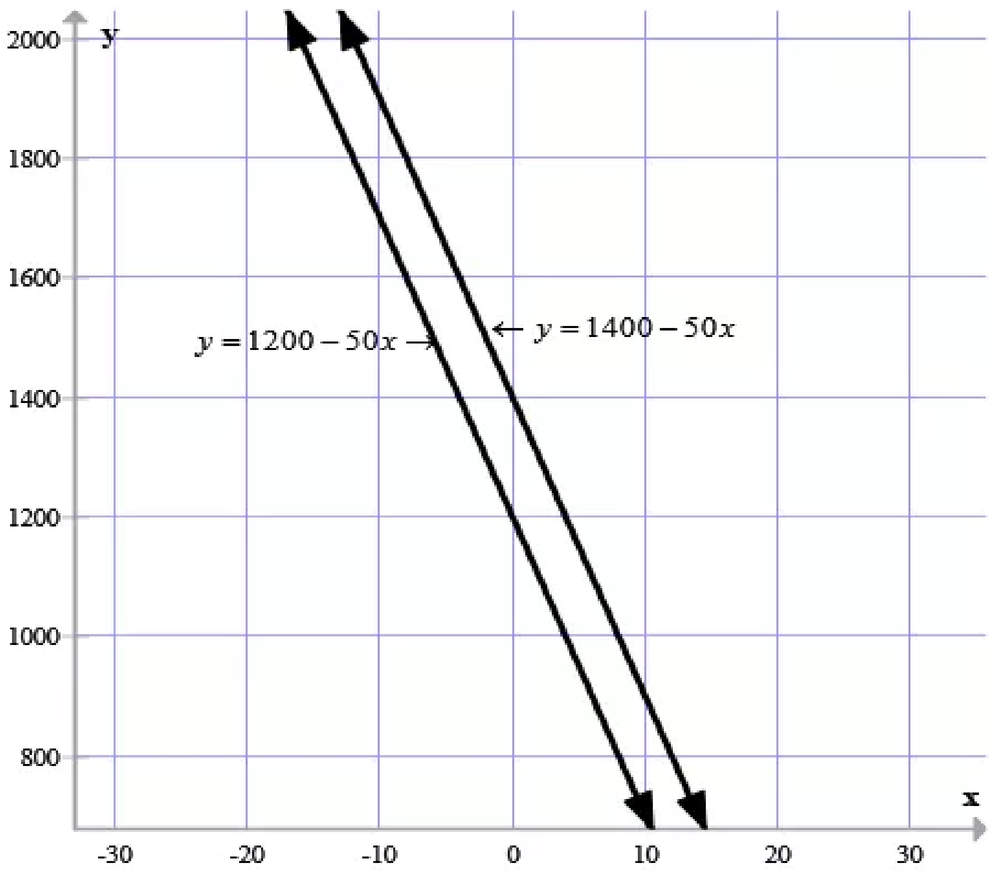
Therefore the slope of the equation (1), we have

$$m = -50$$

The slope of the equation (1) and (2) is $m = -50$.

So the graphs of equation (1) and (2) are geometrically parallel.

The graph of two equation (1) and (2) are shown in the same coordinate plane as follows:



(b)

The x-intercept represent $y=0$, that menace the number of words we have left to type after x minutes is 0. Therefore no word to type.

The y-intercept represent $x=0$, that menace the number of words we have left to type after x minutes is y. Therefore the typing of words is just start.

The slope m or $\frac{y}{x}$ represent the speed of typing.

(c)

To identify the x-intercept putting $y=0$ in the equation (1) and solving for x.

$$y = 1400 - 50x \qquad [\text{Let } y = 0]$$

$$50x = 1400 \qquad [\text{Solve for } x]$$

$$x = 28$$

So, the x-intercept is 28.

Again ,to identify the x-intercept putting $y=0$ in the equation (2) and solving for x.

$$y = 1200 - 50x \qquad [\text{Let } y = 0]$$

$$50x = 1200 \qquad [\text{Solve for } x]$$

$$x = 24$$

So, the x-intercept is 24.

Therefore the friend will finish the typing first.

Answer 69e.

We need to cover a five-by-five grid completely with x three-by-one rectangles and y four-by-one rectangles that do not overlap or extend beyond the grid.

(a)

The area of the five-by-five grid is $25\,\text{square units}$, therefore the equation of the five-by-five grid completely with x three-by-one rectangles and y four-by-one rectangles is $3x+4y=25$.

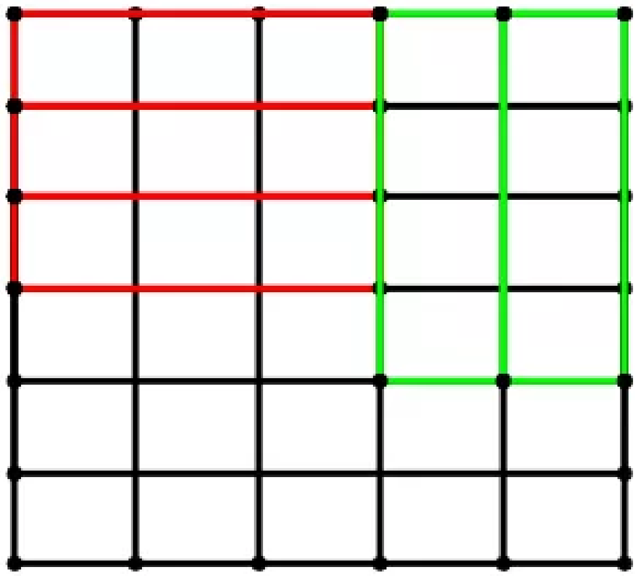
And x and y must be whole numbers since x represents three-by-one rectangles and y represents four-by-one rectangles.

(b)

The solutions of the equation $3x+4y=25$ that are whole numbers are $\boxed{(3,4)\text{ and }(7,1)}$.

(c)

Three numbers of three-by-one rectangles and four numbers of four-by-one rectangles cannot complete the five-by-five grid since for 3 three-by-one rectangles horizontally placed , there should be 2 four-by-one rectangles vertically placed and another 2 four-by-one rectangles cannot complete the grid as shown in the figure below:



Similarly, seven numbers of three-by-one rectangles and one number of four-by-one rectangles cannot complete the five-by-five grid since for 6 three-by-one rectangles horizontally placed and one vertically placed, one four-by-one rectangle cannot complete the grid as shown in the figure below:

Answer 70e.

Given that

$3n-10$ when $n=5$ ...... (1)

Here we need to evaluate the expression (1), for the given value of the variable n .

From equation (1), we get

$3n-10$ when $n=5$

$=3\cdot 5-10$

$=15-10$

$=5$

Therefore evaluate the expression (1), for the given value of the variable n is 5.

Answer 71e.

Substitute -2 for x in the given expression.
$-4x + 16 = -4(-2) + 16$

By the order of operations, multiplication has higher precedence than addition. Multiply -4 by -2.
$-4(-2) + 16 = 8 + 16$

Now, add.
$8 + 16 = 24$

Therefore, when x is -2, the value of the given expression is 24.

Answer 72e.

Given that

$$2(11-5p) \text{ when } p=4 \qquad \ldots\ldots (1)$$

Here we need to evaluate the expression (1), for the given value of the variable p.

From equation (1), we get

$$\begin{aligned} &2(11-5p) \text{ when } p=4 \\ &=2(11-5\cdot 4) \\ &=2(11-20) \\ &=2(-9) \\ &=-18 \end{aligned}$$

Therefore evaluate the expression (1), for the given value of the variable p is -18.

Answer 73e.

Substitute -1 for q in the given expression.
$(4q + 5)(2q) = [4(-1) + 5][2(-1)]$

By the order of operations, first we have to do operations within the brackets. Inside the brackets, multiplication has higher precedence than addition. Multiply 4 by -1 and 2 by -1.
$[4(-1) + 5][2(-1)] = (-4 + 5)(-2)$

The next precedence is for operations within the parentheses. Add -4 and 5.
$(-4 + 5)(-2) = 1(-2)$

Finally, multiply 1 by -2.
$1(-2) = -2$

Therefore, when q is -1, the value of the given expression is -2.

Answer 74e.

Given that

$m^2 - 4m$ when $m = -3$ ...... (1)

Here we need to evaluate the expression (1), for the given value of the variable p.

From equation (1), we get

$m^2 - 4m$ when $m = -3$

$= (-3)^2 - 4(-3)$

$= 9 + 12$

$= 21$

Therefore evaluate the expression (1), for the given value of the variable m is 21.

Answer 75e.

Substitute 6 for d in the given expression.

$(d+1)^2 - d = (6+1)^2 - 6$

By the order of operations, first we have to do operations within the grouping symbols.
Add 6 and 1.

$(6+1)^2 - 6 = 7^2 - 6$

Then, evaluate the power.

$7^2 - 6 = 49 - 6$

Finally, subtract.

$49 - 6 = 43$

Therefore, when d is 6, the value of the given expression is 43.

Answer 76e.

Given relation is

$(-2,-7),(0,3),(1,-2),(-2,13),(3,-12)$

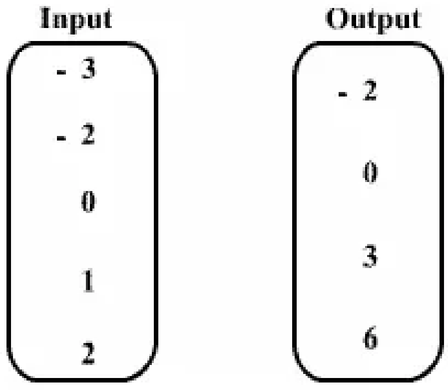
Here we need to say the given relation is a function or not.

A function is a relation in which NO two ordered pairs have the same first coordinate.
the given relation (1), is a function because none of the five ordered pairs have the same first coordinate.

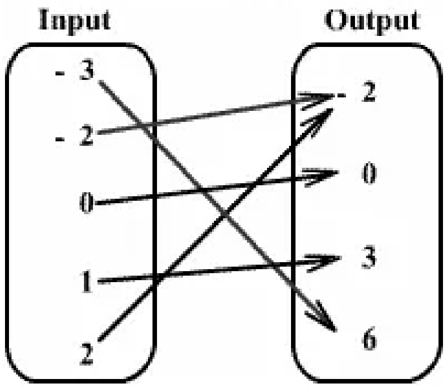
So, we can say that the given relation (1), is a function.

Answer 77e.

We need to represent the relation using a mapping diagram. For this, first sort the input values and the output values in the ascending order. Then, write the input and output values side by side in two rounded rectangles.



Draw an arrow from each input value to the corresponding output value.



If each input of a relation has exactly one output, then the relation is a function. From the mapping diagram, we can see that each input is mapped onto exactly one output. Therefore, the given relation is a function.

Answer 78e.

The given points are

$$(1,-3)(5,0)$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Now, putting the point $(1,-3)$ in the equation (1), we get

$$y = mx + b$$
$$-3 = m \cdot 1 + b$$
$$-3 = 1m + b \qquad \ldots\ldots (2)$$

Again, we putting the point $(5,0)$ in the equation (1), we get

$$y = mx + b$$
$$0 = m \cdot 5 + b$$
$$0 = 5m + b \qquad \ldots\ldots (3)$$

Subtracting the equation (2) from (3), we have

$$0 + 3 = 5m + b - m - b$$
$$3 = 4m$$
$$m = \frac{3}{4}$$

Therefore the slope of the line passing through the points $(1,-3)(5,0)$ is $\boxed{m = \frac{3}{4}}$

Answer 79e.

The slope m of a nonvertical line passing through the points (x_1, y_1) and (x_2, y_2) is

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

For finding the slope of the line that passes through the given points, first substitute -7 for y_2, 1 for y_1, 6 for x_2, and -2 for x_1.

$$m = \frac{-7 - 1}{6 - (-2)}$$

Evaluate.

$$m = \frac{-8}{8}$$
$$= -1$$

Therefore, the slope of the line that passes through the given points is -1.

Answer 80e.

The given points are

$$(4,4)(8,4)$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \ldots\ldots (1)$$

where m be the slope of the line and b be the y-intercept.

Now, putting the point $(4,4)$ in the equation (1), we get

$$y = mx + b$$
$$4 = m \cdot 4 + b$$
$$4 = 4m + b \qquad \text{...... (2)}$$

Again, we putting the point $(8,4)$ in the equation (1), we get

$$y = mx + b$$
$$4 = m \cdot 8 + b$$
$$4 = 8m + b \qquad \text{...... (3)}$$

Subtracting the equation (2) from (3), we have

$$4 - 4 = 4m + b - 8m - b$$
$$0 = -4m$$
$$m = 0$$

Therefore the slope of the line passing through the points $(4,4)(8,4)$ is $\boxed{m = 0}$

Answer 81e.

The slope m of a nonvertical line passing through the points (x_1, y_1) and (x_2, y_2) is

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

For finding the slope of the line that passes through the given points, first substitute 8 for y_2, 5 for y_1, -5 for x_2, and 2 for x_1.

$$m = \frac{8 - 5}{-5 - 2}$$

Evaluate.

$$m = \frac{3}{-7}$$
$$= -\frac{3}{7}$$

Therefore, the slope of the line that passes through the given points is $-\frac{3}{7}$.

Answer 82e.

The given points are

$$(6,-3)(1,-13)$$

The slope intercept of the equation of a line is

$$y = mx + b \qquad \text{...... (1)}$$

where m be the slope of the line and b be the y-intercept.

Now, putting the point $(6,-3)$ in the equation (1), we get

$$y = mx + b$$
$$-3 = m \cdot 6 + b$$
$$-3 = 6m + b \qquad \ldots\ldots (2)$$

Again, we putting the point $(1,-13)$ in the equation (1), we get

$$y = mx + b$$
$$-13 = m \cdot 1 + b$$
$$-13 = 1m + b \qquad \ldots\ldots (3)$$

Subtracting the equation (2) from (3), we have

$$-13 + 3 = 1m + b - 6m - b$$
$$-10 = -5m$$
$$m = 2$$

Therefore the slope of the line passing through the points $(6,-3)(1,-13)$ is $\boxed{m = 2}$

Answer 83e.

The slope m of a nonvertical line passing through the points (x_1, y_1) and (x_2, y_2) is

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

For finding the slope of the line that passes through the given points, first substitute -4 for y_2, 0 for y_1, -3.5 for x_2, and 2.5 for x_1.

$$m = \frac{-4 - 0}{-3.5 - 2.5}$$

Evaluate.

$$m = \frac{-4}{6}$$
$$= -\frac{2}{3}$$

Therefore, the slope of the line that passes through the given points is $-\frac{2}{3}$.