

EXERCISE 23.2

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1. Find the equation of the line parallel to x-axis and passing through (3, -5).**Solution:**

Given: A line which is parallel to x-axis and passing through (3, -5)

By using the formula,

The equation of line: $[y - y_1 = m(x - x_1)]$

We know that the parallel lines have equal slopes

And, the slope of x-axis is always 0

Then

The slope of line, $m = 0$ Coordinates of line are $(x_1, y_1) = (3, -5)$ The equation of line = $y - y_1 = m(x - x_1)$

Now, substitute the values, we get

$$y - (-5) = 0(x - 3)$$

$$y + 5 = 0$$

 \therefore The equation of line is $y + 5 = 0$ **2. Find the equation of the line perpendicular to x-axis and having intercept -2 on x-axis.****Solution:**

Given: A line which is perpendicular to x-axis and having intercept -2

By using the formula,

The equation of line: $[y - y_1 = m(x - x_1)]$

We know that, the line is perpendicular to the x-axis, then x is 0 and y is -1.

$$\begin{aligned} \text{The slope of line is, } m &= y/x \\ &= -1/0 \end{aligned}$$

It is given that x-intercept is -2, so, y is 0.

Coordinates of line are $(x_1, y_1) = (-2, 0)$ The equation of line = $y - y_1 = m(x - x_1)$

Now, substitute the values, we get

$$y - 0 = (-1/0)(x - (-2))$$

$$x + 2 = 0$$

 \therefore The equation of line is $x + 2 = 0$ **3. Find the equation of the line parallel to x-axis and having intercept -2 on y-axis.****Solution:**

Given: A line which is parallel to x-axis and having intercept -2 on y-axis

By using the formula,

The equation of line: $[y - y_1 = m(x - x_1)]$

The parallel lines have equal slopes,

And, the slope of x-axis is always 0

Then

The slope of line, $m = 0$

It is given that intercept is -2 , on y-axis then

Coordinates of line are $(x_1, y_1) = (0, -2)$

The equation of line is $y - y_1 = m(x - x_1)$

Now, substitute the values, we get

$$y - (-2) = 0(x - 0)$$

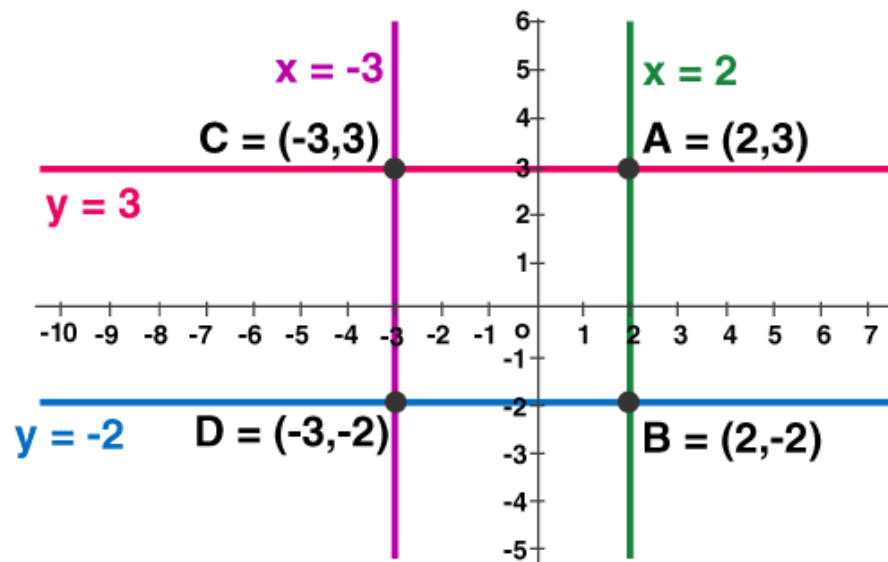
$$y + 2 = 0$$

\therefore The equation of line is $y + 2 = 0$

4. Draw the lines $x = -3$, $x = 2$, $y = -2$, $y = 3$ and write the coordinates of the vertices of the square so formed.

Solution:

Given: $x = -3$, $x = 2$, $y = -2$ and $y = 3$



\therefore The Coordinates of the square are: $A(2, 3)$, $B(2, -2)$, $C(-3, 3)$, and $D(-3, -2)$.

5. Find the equations of the straight lines which pass through $(4, 3)$ and are respectively parallel and perpendicular to the x-axis.

Solution:

Given: A line which is perpendicular and parallel to x-axis respectively and passing through (4, 3)

By using the formula,

The equation of line: $[y - y_1 = m(x - x_1)]$

Let us consider,

Case 1: When Line is parallel to x-axis

The parallel lines have equal slopes,

And, the slope of x-axis is always 0, then

The slope of line, $m = 0$

Coordinates of line are $(x_1, y_1) = (4, 3)$

The equation of line is $y - y_1 = m(x - x_1)$

Now substitute the values, we get

$$y - (3) = 0(x - 4)$$

$$y - 3 = 0$$

Case 2: When line is perpendicular to x-axis

The line is perpendicular to the x-axis, then x is 0 and y is -1.

The slope of the line is, $m = y/x$

$$= -1/0$$

Coordinates of line are $(x_1, y_1) = (4, 3)$

The equation of line = $y - y_1 = m(x - x_1)$

Now substitute the values, we get

$$y - 3 = (-1/0)(x - 4)$$

$$x = 4$$

∴ The equation of line when it is parallel to x-axis is $y = 3$ and it is perpendicular is $x = 4$.