RD Sharma Solutions Class 11 Maths Chapter 15 Ex 15.5

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Linear Inequations Ex 15.5 Q1

We have,

$x + 2y - y \leq 0$

$\Rightarrow \quad x + y \leq 0$

Converting the given inequation into equation we obtain, $x + y = 0$.

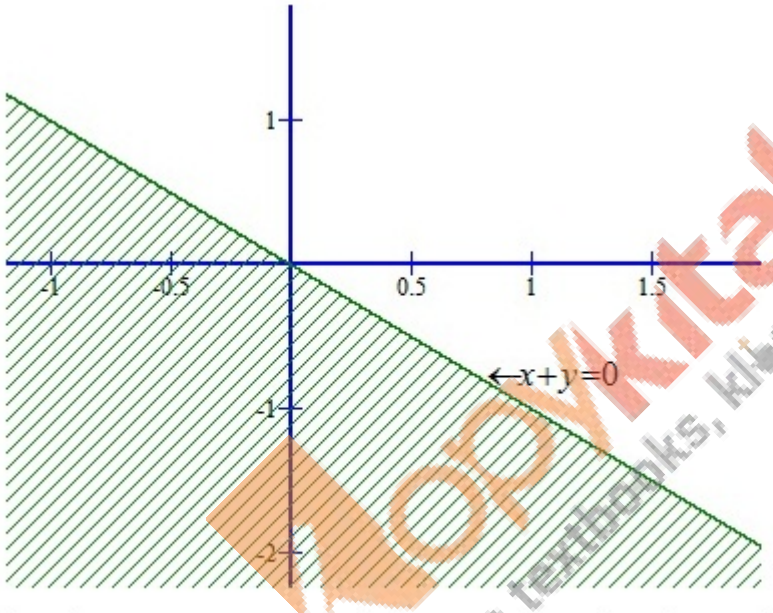
Putting $y = 0$, we get $x = 0$

Putting $x = 0$, we get $y = 0$

Putting $x = 3$, we get $y = -3$.

We plot these points and join them by a thick line. This lines divider the xy – plane in two parts. To determine the region represented by the given inequality consider the inequality.

So, the region containing the origin is represented by the given ineqation as show below:



This region represents the solution set of the given inequations.

Linear Inequations Ex 15.5 Q2

We have,

$x + 2y \geq 6$

Converting the inequation into equation, we obtain, $x + 2y = 6$.

Putting $y = 0$, we get $x = 6$

Putting $x = 0$, we get $2y = 6 \Rightarrow y = 3$

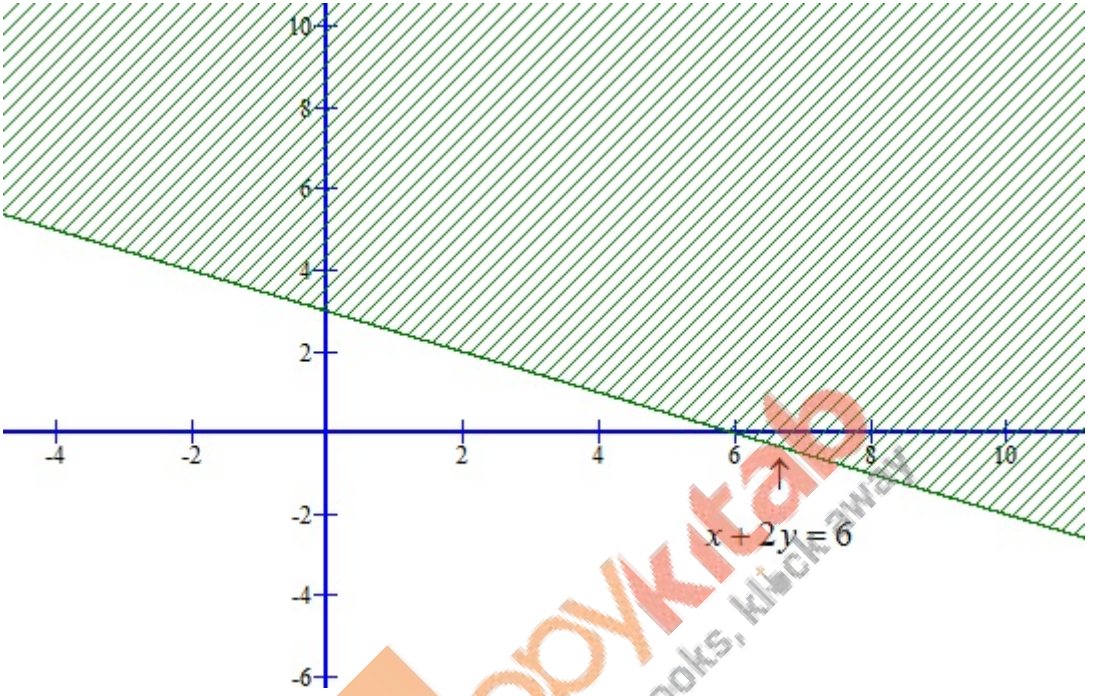
We plot these points and join them by a thick line. This lines divider the xy – plane in two parts. To determine the region represented by the given inequality consider the point $0(0, 0)$.

Putting $x = 0$ and $y = 0$ in (i) we get, $0 \geq 6$

It is not possible.

Clearly, $0(0,0)$ does not satisfies the inequality.

So, the region represented by the given inequation is the shaded region shown below:



Linear Inequations Ex 15.5 Q3

We have,

$$x+2\geq 0 \ldots\ldots\ldots\ldots\ldots\ldots (i)$$

Converting the inequation into equation, we obtain, $x = -2$. Clearly, it is a line parallel to y-axis. This line divides the xy – plane in two parts. One part on the LHS of $x = -2$ and the other on its RHS.

Putting $x = 0$ in the inequation (i), we get $2 \geq 0$

we find that the point $(0,0)$ satisfies the inequality. So, the region represented by the given inequation is the shaded region shown below:

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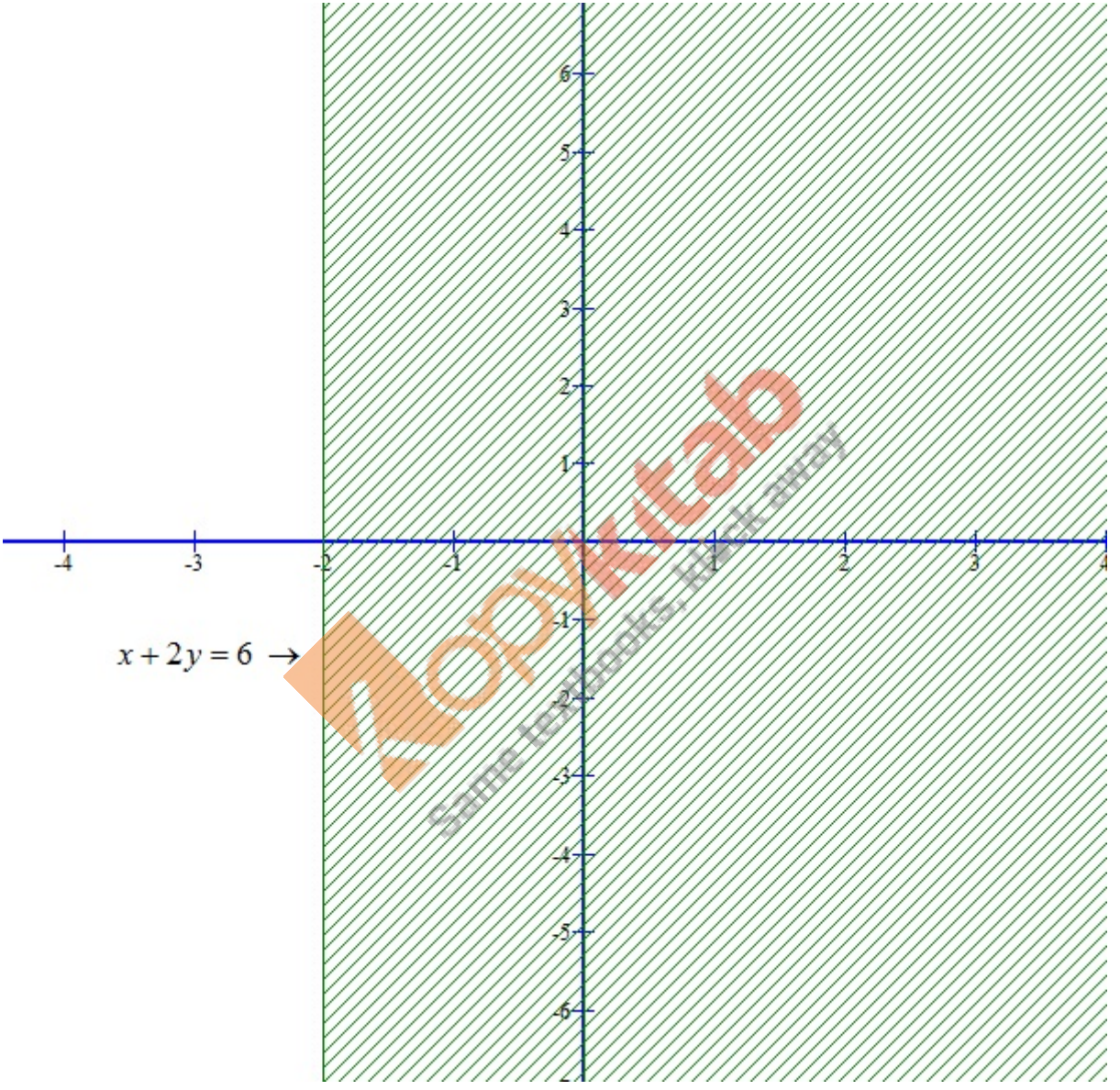


Linear Inequations Ex 15.5 Q4

We have

$$x - 2y < 0$$

Converting the inequation into eqaution, we obtain,

$$x < 2y$$

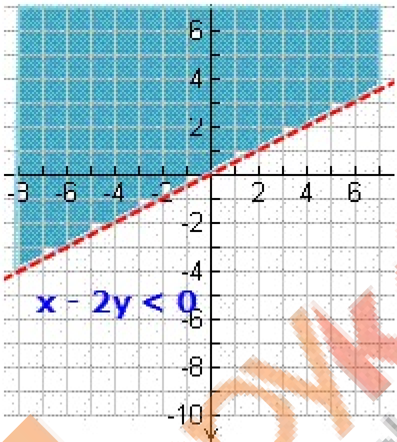
To determine the region represented by the given inequality consider the point $o(0,0)$

Putting $x = 0$ and $y = 0$ in equation we have

$$0 < 0$$

It is not possibvle.Clearly $o(0,0)$ does not satisfy the inequality.

So, the region represented by the given inequation is the shadd region shown below:



Linear Inequations Ex 15.5 Q5

We have,

$$-3x + 2y \leq 6 \ldots\ldots\ldots\ldots\ldots\text{(i)}$$

Converting the given inequation into equation, we obtain, $-3x + 2y = 6$.

Putting $x = 0$, we get $y = \frac{6}{2} = 3$

Putting $y = 0$, we get $x = \frac{-6}{3} = -2$

we plot these points and join them by a thick line. This line meets x-axis at $(-2, 0)$ and y-axis at $(0,3)$. This line divides the xy-plan into two parts. To determine the region represented by the given inequality, consider the point $O(0,0)$.

Putting $x = 0$ and $y = 0$ in the inequation(i), we get, $0 \leq 6$

Clearly, $(0,0)$ satisfies the inequality. So the region containing the origin is represented by the given inequation as shown below.

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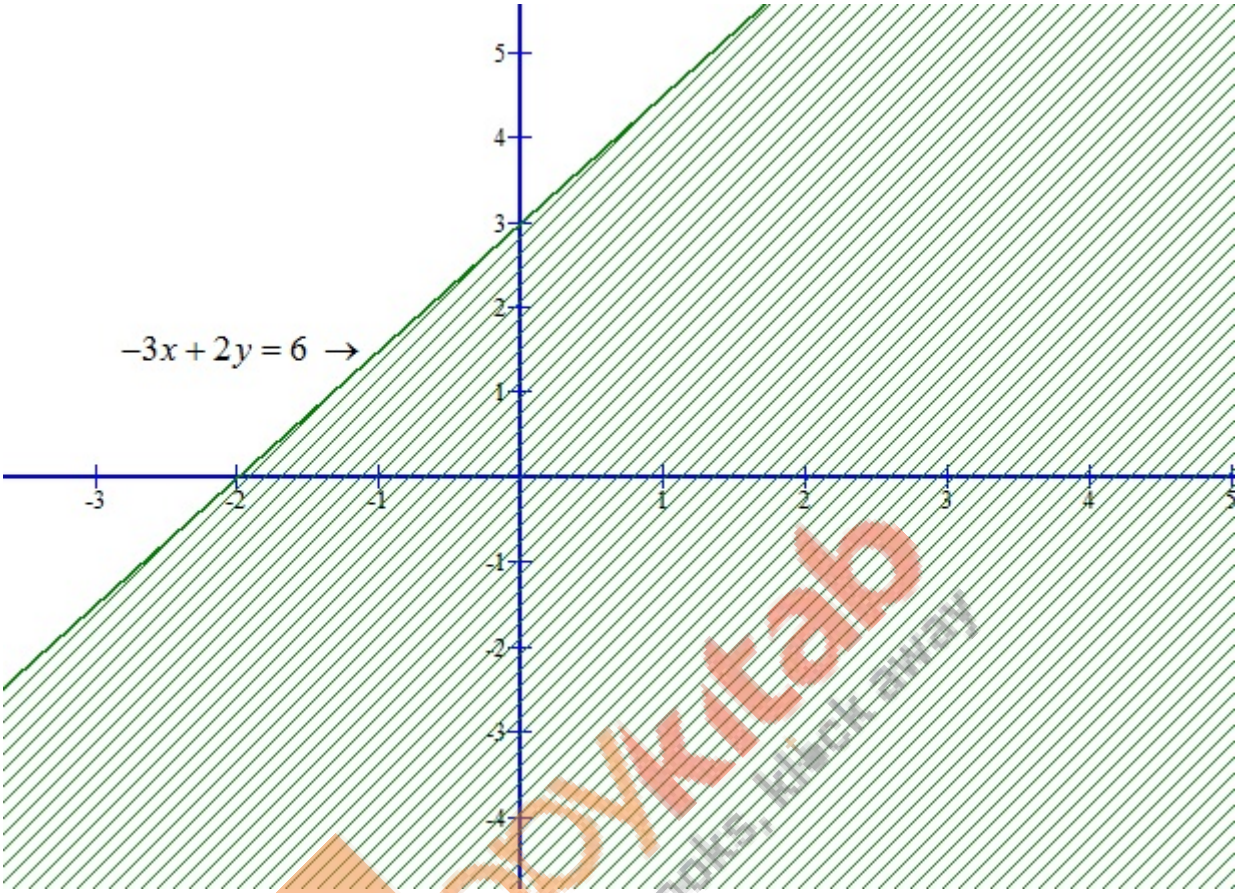

Linear Inequations Ex 15.5 Q6

We have,

$x \leq 8 - 4y$ ..... (i)

Converting the given inequation into equation, we obtain, $x = 8 - 4y$.

Putting $y = 0$, we get $x = 8$

Putting $x = 0$, we get $y = \frac{8}{4} = 2$

So, this line meets x-axis at $(8,0)$ and y-axis at $(0,2)$.

we plot these points and join them by a thick line. This line divides the xy-plane in two parts. To determine the region represented the given inequality consider the point $O(0,0)$.

Putting $x = 0$ and $y = 0$ in the inequation (i), we get $0 \leq 8$

Clearly, $(0,0)$ satisfies the inequality. so, the region containing the origin is represented by the given inequation as shown below:

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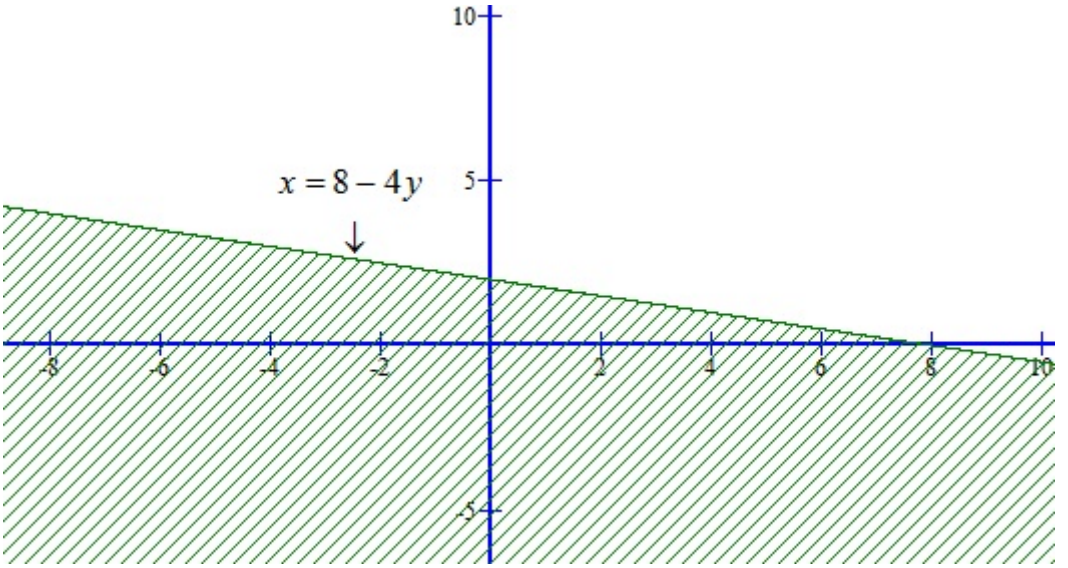


Linear Inequations Ex 15.5 Q7

We have,

$$0 \le 2x - 5y + 10 \ldots\ldots\ldots\ldots\ldots\ldots (i)$$

Converting the given inequation into equation, we obtain, $2x - 5y + 10 = 0$.

Putting $x = 0$, we get $y = \frac{-10}{-5} = 2$

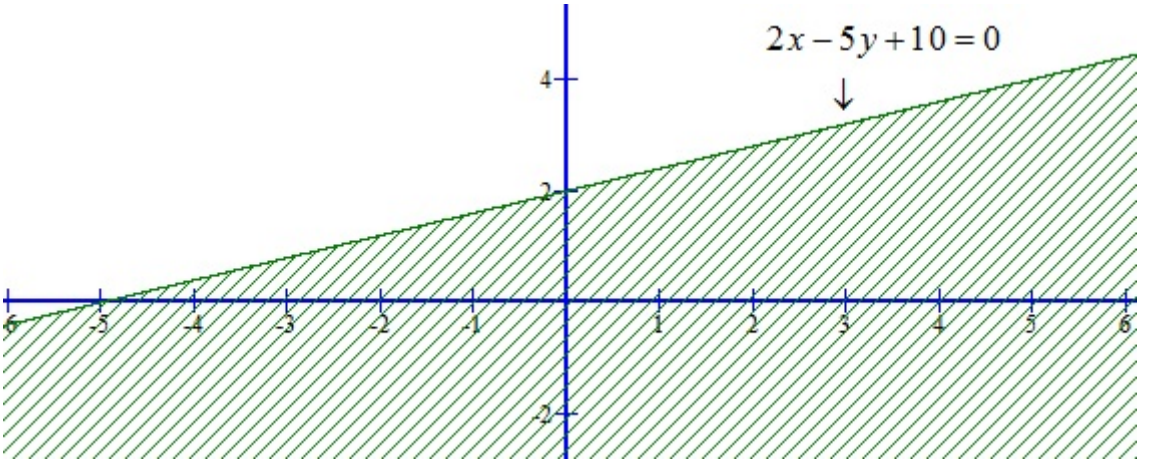
Putting $y = 0$, we get $x = \frac{-10}{2} = -5$

So, this line meets x-axis at $(-5,0)$ and y-axis at $(0,2)$.

we plot these points and join them by a thick line. This line divides the xy-plane in two parts. To determine the region represented by the given inequality consider the point $0(0,0)$.

Putting $x = 0$ and $y = 0$ in the inequation (i), we get $0 \le 10$

Clearly, $(0,0)$ satisfies the inequality, so, the region containing the origin is represented by the given inequation as shown below:



Linear Inequations Ex 15.5 Q8

We have,

$3y \geq 6 - 2x$.....(i)

Converting the given inequation into equation, we obtain, $3y = 6 - 2x$.

Putting $x = 0$, we get $y = \frac{6}{3} = 2$

Putting $y = 0$, we get $x = \frac{6}{2} = 3$

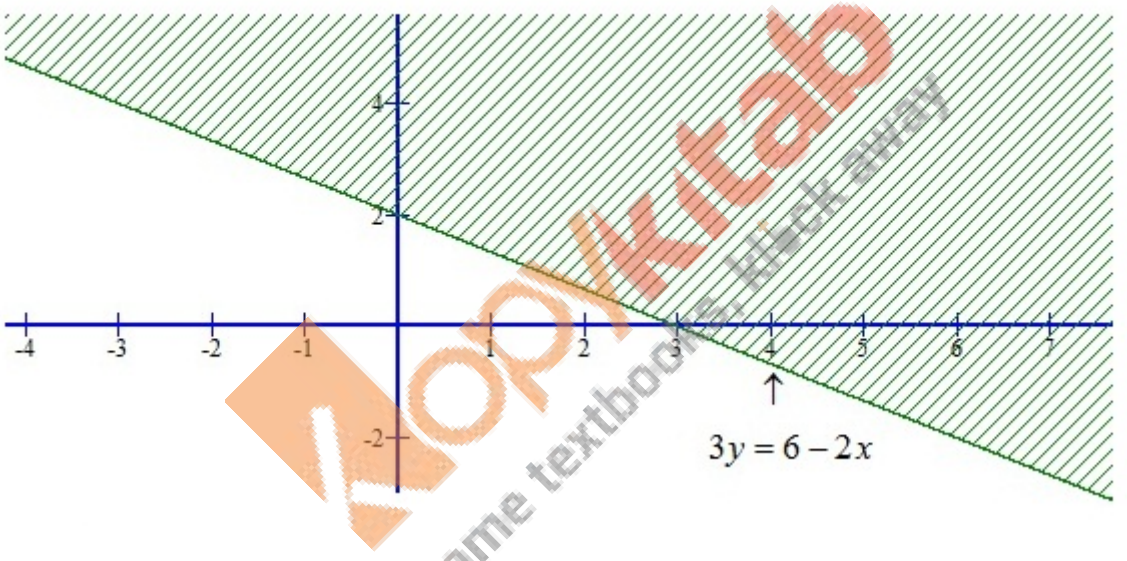
So, this line meets x-axis at $(3,0)$ and y-axis at $(0,2)$.

we plot these points and join them by a thick line. This line divides the xy-plane in two parts. To determine the region represented by the given inequality consider the point $O(0,0)$.

Putting $x = 0$ and $y = 0$ in the inequation (i), we get $0 \geq 6$ it is not possible.

$\therefore$ we find that the point $(0,0)$ does not satisfy the equation $3y \geq 6 - 2x$.

So, the region represented by the given equation is shaded region shown below:



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Linear Inequations Ex 15.5 Q9

We have,

$y \geq 2x - 8$.....(i)

Converting the given inequation into equation, we obtain, $y = 2x - 8$.

Putting $x = 0$, we get $y = -8$

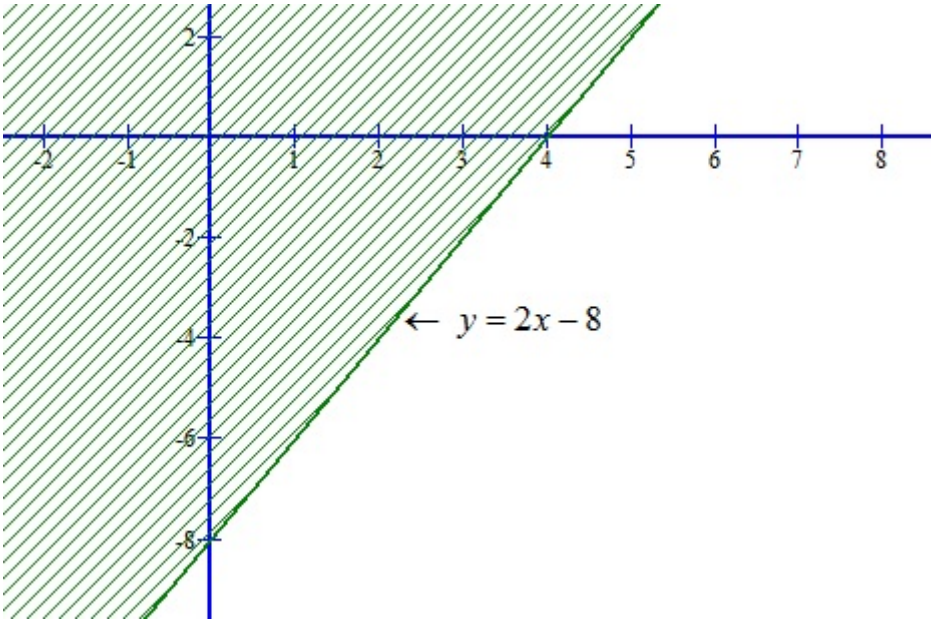
Putting $y = 0$, we get $x = \frac{8}{2} = 4$

So, this line meets x-axis at $(4,0)$ and y-axis at $(0,-8)$.

we plot these points and join them by a line. This line divides the xy-plane in two parts. To determine the region represented by the given inequality consider the point $O(0,0)$.

Putting $x = 0$ and $y = 0$ in the inequation (i), we get $0 \geq -8$

Clearly, $(0,0)$ satisfies the inequality the region containing the origin is represented by the given inequation as show below:



Linear Inequations Ex 15.5 Q10

We have,

$3x - 2y \le x + y - 8$

$\Rightarrow \quad 3x - x \le y + 2y - 8$

$\Rightarrow \quad 2x \le 3y - 8 \ldots\ldots\ldots\ldots (i)$

Converting the given inequation into equation, we obtain, $2x = 3y - 8$.

Putting $y = 0$, we get $x = \frac{-8}{2} = -4$

Putting $x = 0$, we get $y = \frac{8}{3}$.

So, this line meets x-axis at $(-4,0)$ and y-axis at $\left(0, \frac{8}{3}\right)$.

we plot these points and join them by a line. This line divides the xy-plane in two parts. To determine the region represented by the given inequality consider the point $O(0,0)$.

Putting $x = 0$ and $y = 0$ in the inequation (i), we get $0 \le -8$ It is not possible.

∴ we find that the point $(0,0)$ does not satisfy the inequation $2x \le 3y - 8$. so, the region represented by the given equation is the shaded region.