

Chapter 6: Linear Inequalities Exercise 6.2

NCERT · Class 11 · Maths

Questions

Question 1

$$x + y < 5$$

Solution

Given, $x + y < 5$

Consider,

x	0	5
y	5	0

Now, draw a dotted line $x + y = 5$ in the graph ($\because x + y = 5$ is excluded in the given question.)

Now, consider $x + y < 5$

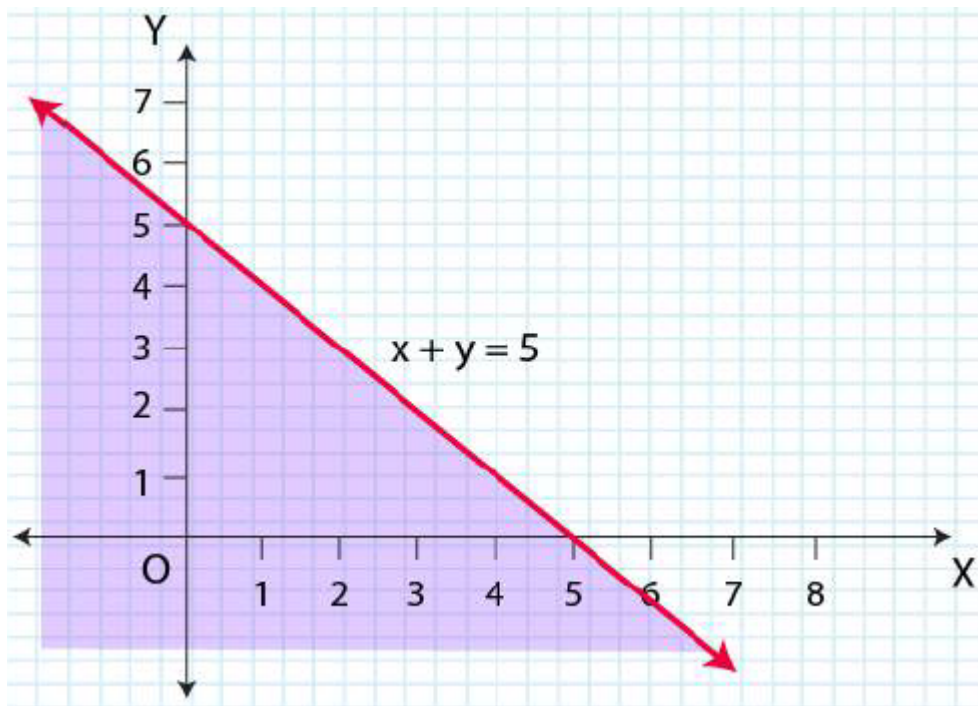
Select a point $(0, 0)$.

$$\Rightarrow 0 + 0 < 5$$

$$\Rightarrow 0 < 5 \text{ (this is true)}$$

$\therefore$ The solution region of the given inequality is below the line $x + y = 5$. (That is, the origin is included in the region.)

The graph is as follows:

**Question 2**

$$2x + y \geq 6$$

Solution

Given $2x + y \geq 6$

Now, draw a solid line $2x + y = 6$ in the graph ($\because 2x + y = 6$ is included in the given question.)

Now, consider $2x + y \geq 6$

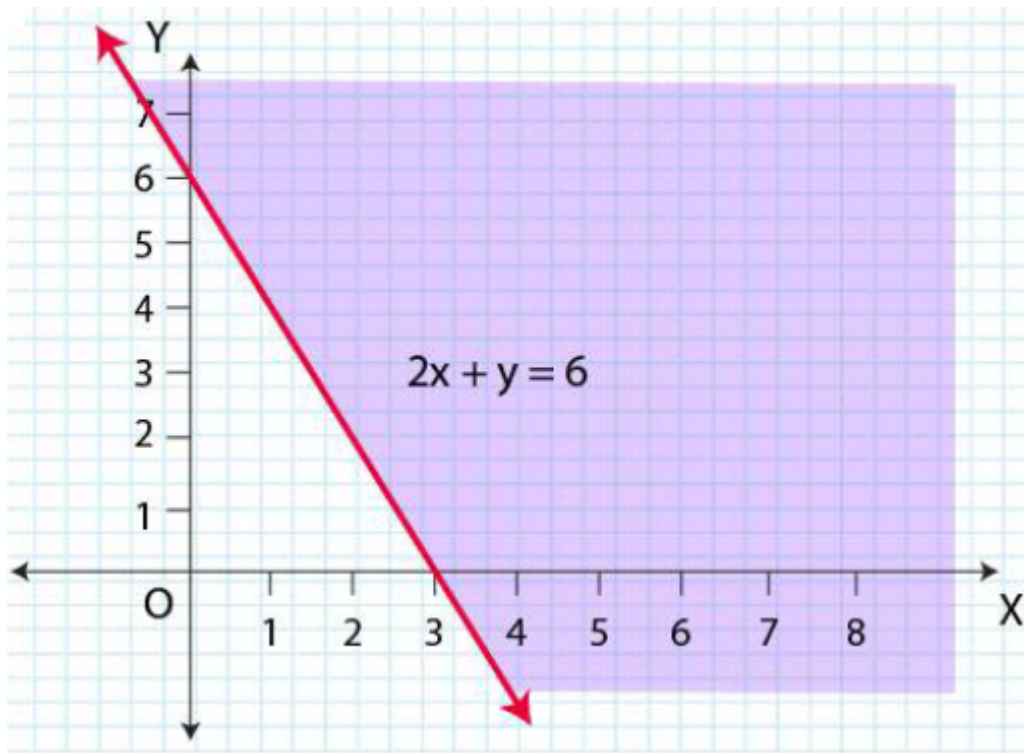
Select a point $(0, 0)$.

$$\Rightarrow 2 \times (0) + 0 \geq 6$$

$$\Rightarrow 0 \geq 6 \text{ (This is false.)}$$

$\therefore$ The solution region of the given inequality is above the line $2x + y = 6$. (Away from the origin.)

The graph is as follows:

**Question 3**

$$3x + 4y \leq 12$$

Solution

Given, $3x + 4y \leq 12$

Now, draw a solid line $3x + 4y = 12$ in the graph ($\because 3x + 4y = 12$ is included in the given question.)

Now, consider $3x + 4y \leq 12$

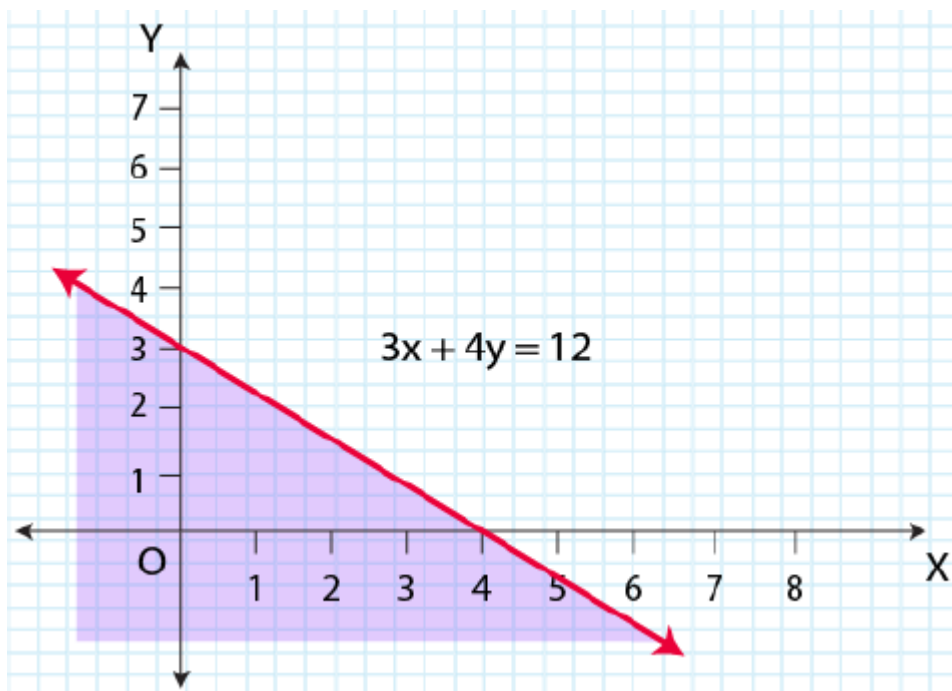
Select a point $(0, 0)$.

$$\Rightarrow 3 \times (0) + 4 \times (0) \leq 12$$

$$\Rightarrow 0 \leq 12 \text{ (This is true.)}$$

$\therefore$ The solution region of the given inequality is below the line $3x + 4y = 12$. (That is, the origin is included in the region.)

The graph is as follows:

**Question 4**

$$y + 8 \geq 2x$$

Solution

Given, $y + 8 \geq 2x$

Now, draw a solid line $y + 8 = 2x$ in the graph ($\because y + 8 = 2x$ is included in the given question.)

Now, consider $y + 8 \geq 2x$

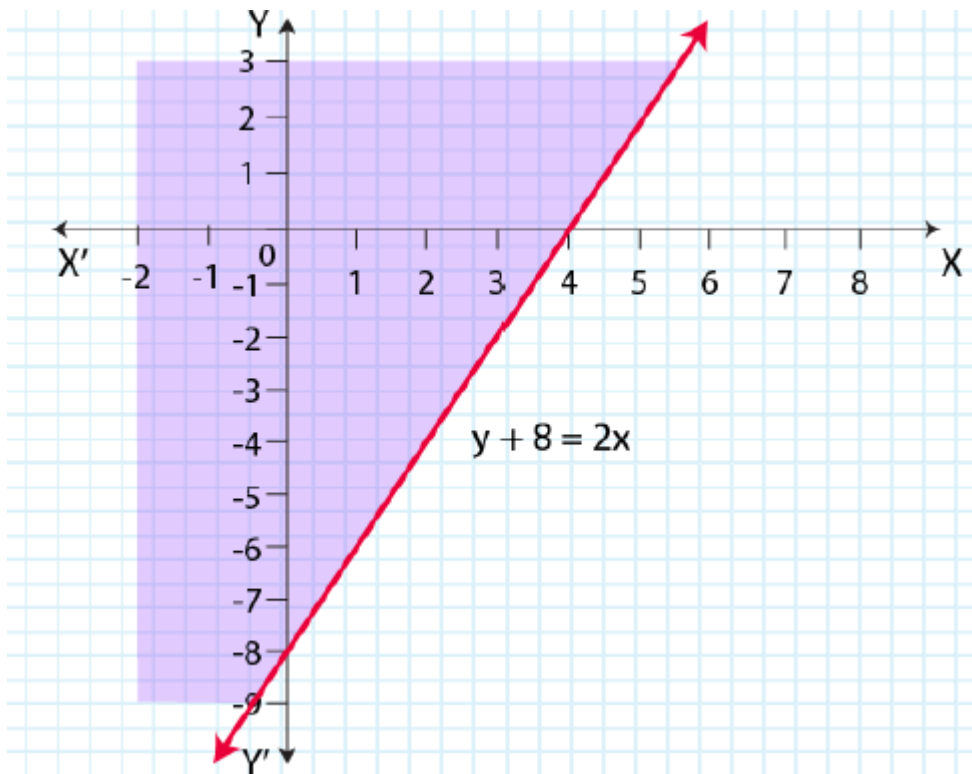
Select a point $(0, 0)$.

$$\Rightarrow (0) + 8 \geq 2 \times (0)$$

$$\Rightarrow 0 \leq 8 \text{ (This is true.)}$$

$\therefore$ The solution region of the given inequality is above the line $y + 8 = 2x$. (That is, the origin is included in the region.)

The graph is as follows:



Question 5

$$x - y \leq 2$$

Solution

Given, $x - y \leq 2$

Now, draw a solid line $x - y = 2$ in the graph ($\because x - y = 2$ is included in the given question.)

Now, consider $x - y \leq 2$

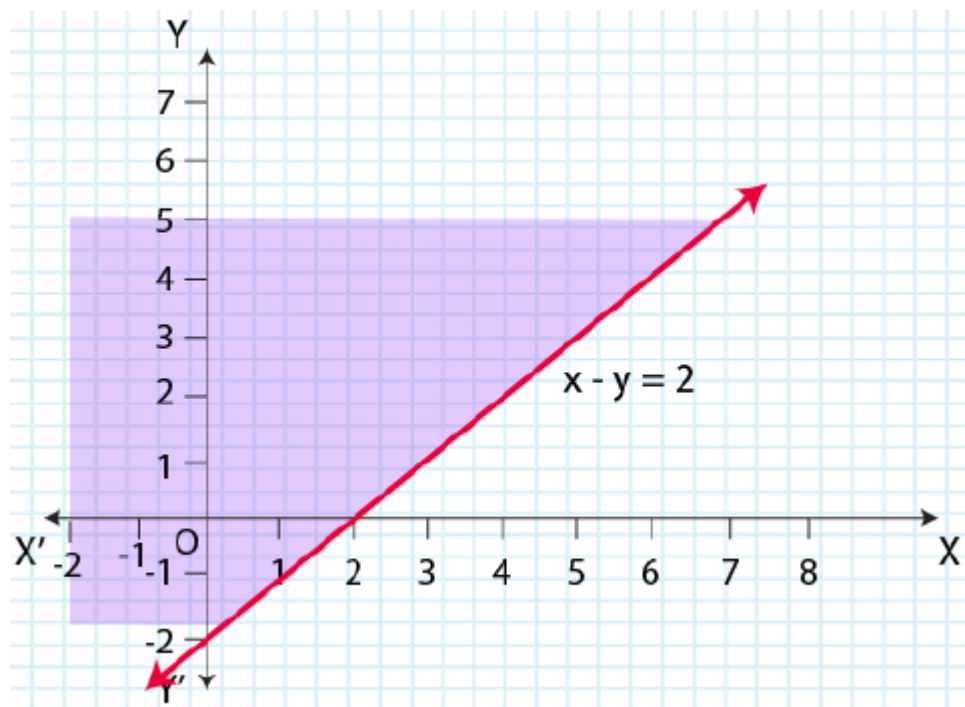
Select a point $(0, 0)$.

$$\Rightarrow (0) - (0) \leq 2$$

$$\Rightarrow 0 \leq 2 \text{ (This is true.)}$$

$\therefore$ The solution region of the given inequality is above the line $x - y = 2$. (That is, the origin is included in the region.)

The graph is as follows:



Question 6

$$2x - 3y > 6$$

Solution

Given, $2x - 3y > 6$

Now, draw a dotted line $2x - 3y = 6$ in the graph ($\because 2x - 3y = 6$ is excluded in the given question.)

Now, consider $2x - 3y > 6$

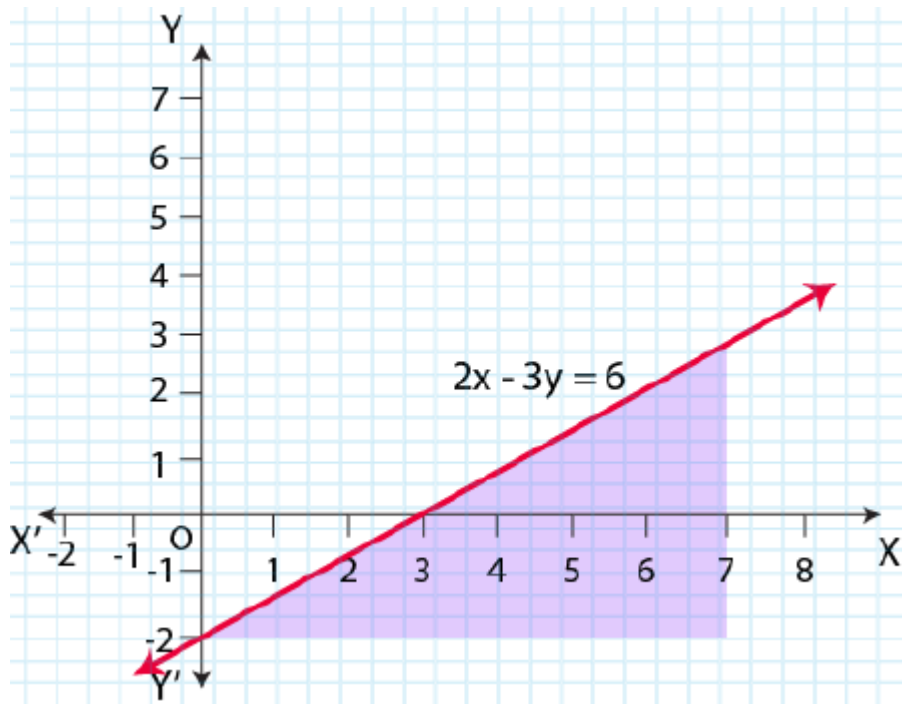
Select a point $(0, 0)$.

$$\Rightarrow 2 \times (0) - 3 \times (0) > 6$$

$$\Rightarrow 0 > 6 \text{ (This is false.)}$$

$\therefore$ The solution region of the given inequality is below the line $2x - 3y > 6$. (Away from the origin.)

The graph is as follows:



Question 7

$$-3x + 2y \geq -6$$

Solution

Given, $-3x + 2y \geq -6$

Now, draw a solid line $-3x + 2y = -6$ in the graph ($\because -3x + 2y = -6$ is included in the given question.)

Now, consider $-3x + 2y \geq -6$

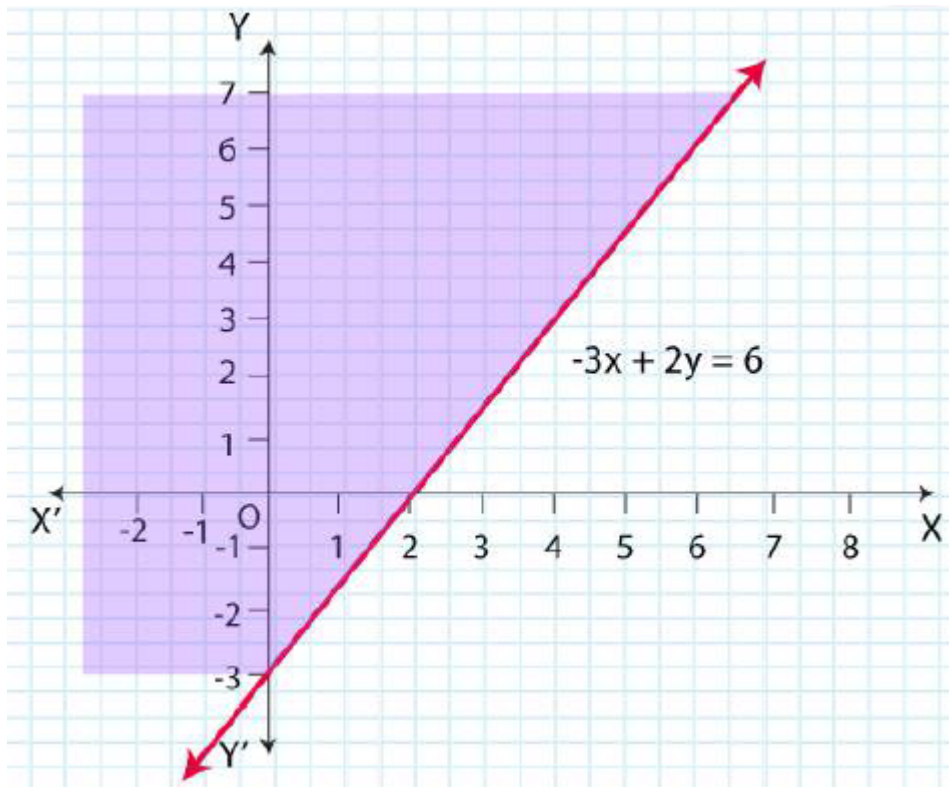
Select a point (0, 0).

$$\Rightarrow -3 \times (0) + 2 \times (0) \geq -6$$

$$\Rightarrow 0 \geq -6 \text{ (This is true.)}$$

$\therefore$ The solution region of the given inequality is above the line $-3x + 2y \geq -6$. (That is, the origin is included in the region)

The graph is as follows:



Question 8

$$y - 5x < 30$$

Solution

Given, $y - 5x < 30$

Now, draw a dotted line $3y - 5x = 30$ in the graph ($\because 3y - 5x = 30$ is excluded in the given question.)

Now, consider $3y - 5x < 30$

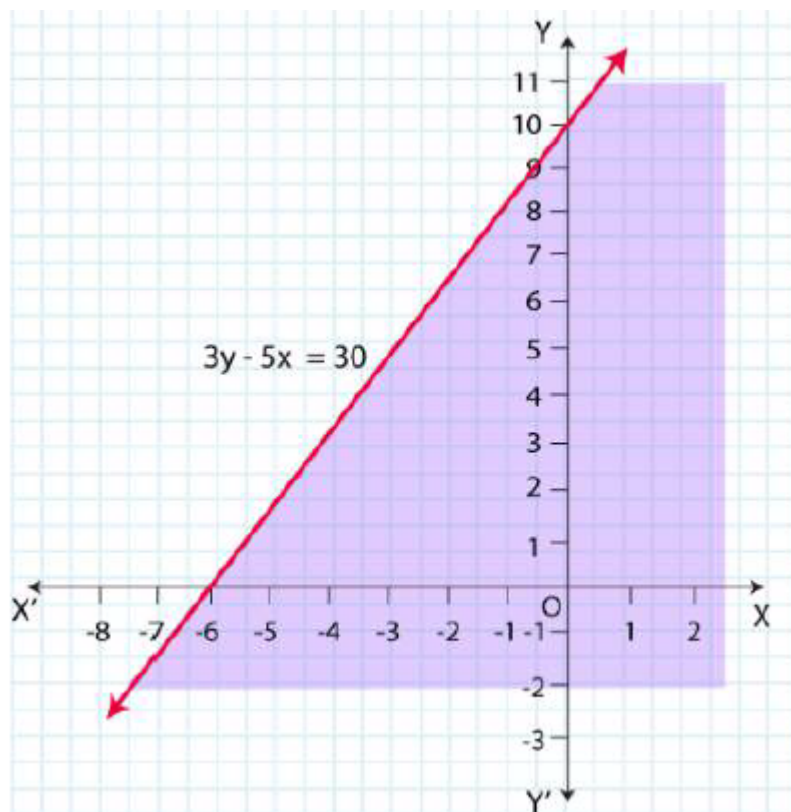
Select a point (0, 0).

$$\Rightarrow 3 \times (0) - 5 \times (0) < 30$$

$$\Rightarrow 0 < 30 \text{ (This is true.)}$$

$\therefore$ The solution region of the given inequality is below the line $3y - 5x < 30$. (That is, the origin is included in the region.)

The graph is as follows:



Question 9

$$y < -2$$

Solution

Given, $y < -2$

Now, draw a dotted line $y = -2$ in the graph ($\because y = -2$ is excluded in the given question.)

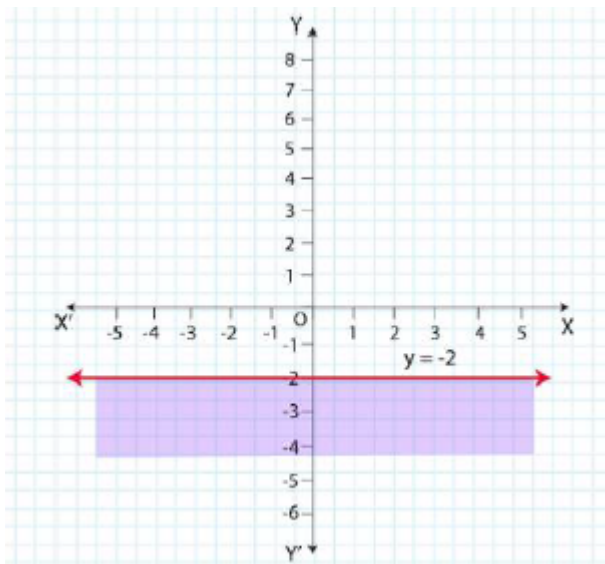
Now, consider $y < -2$

Select a point $(0, 0)$.

$$\Rightarrow 0 < -2 \text{ (This is false)}$$

$\therefore$ The solution region of the given inequality is below the line $y < -2$. (That is, away from the origin.)

The graph is as follows:



Question 10

$$x > -3$$

Solution

Given, $x > -3$

Now, draw a dotted line $x = -3$ in the graph (∵ $x = -3$ is excluded in the given question.)

Now, consider $x > -3$

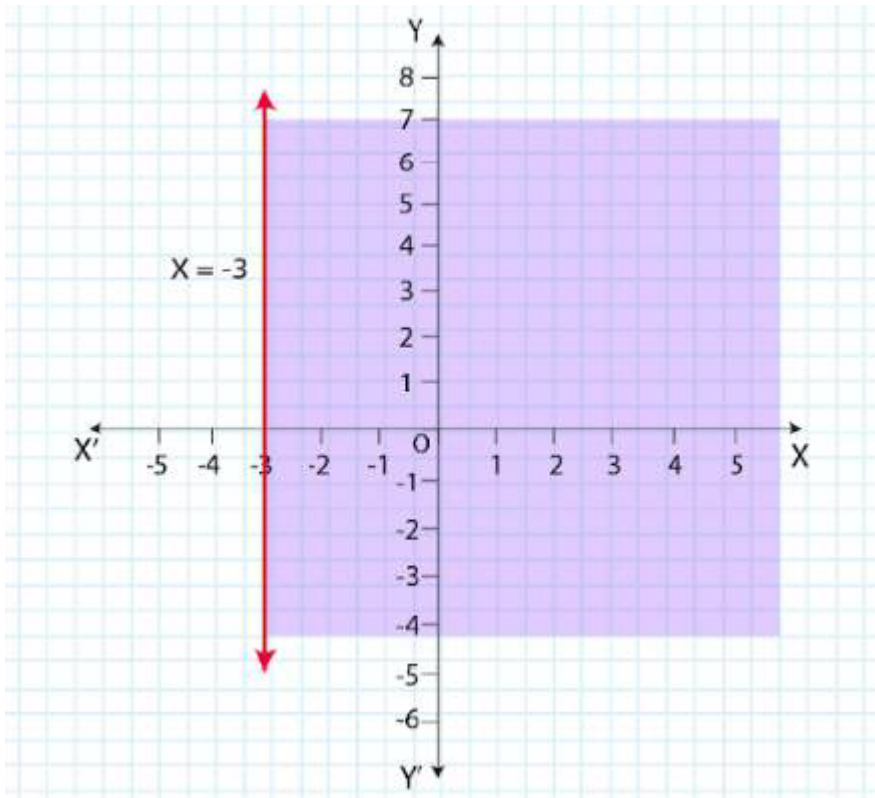
Select a point $(0, 0)$.

$$\Rightarrow 0 > -3$$

$$\Rightarrow 0 > -3 \text{ (This is true.)}$$

∴ The solution region of the given inequality is right to the line $x > -3$. (That is, the origin is included in the region.)

The graph is as follows:



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Exercise 6.3 Solutions 15 Questions

Miscellaneous Exercise on Chapter 6 Solutions 14 Questions