Exercise 33A page: 1357

1.

Solution:

It is given that

$x + y \geq 4$ ….. (1)

So the linear equation is

$x + y = 4$ ….. (2)

Let us draw the line $x + y = 4$

If $x = 0$ we get

$0 + y = 4$

$y = 4$

If $y = 0$ we get

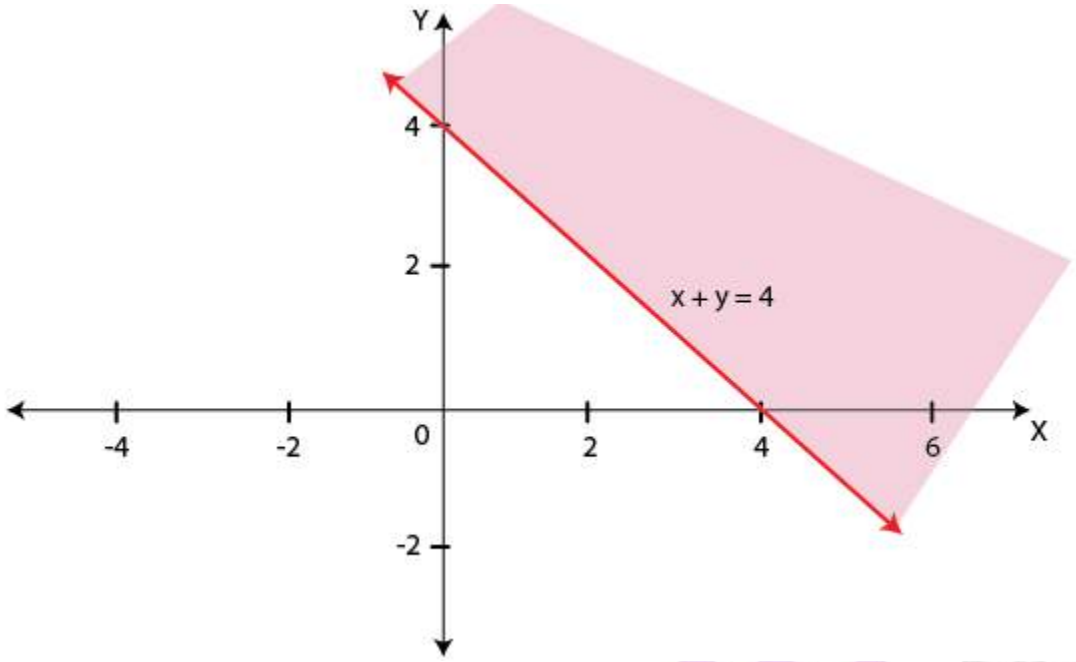
$x + 0 = 4$

$x = 4$

So the points (0, 4) and (4, 0) are on the line

Line which joins these two points divides the xy plane in two half planes

Now by putting (0, 0) in $x + y \geq 4$ is false



Hence, the closed half-plane does not contain origin in the graph of the given inequation.

2.

Solution:

It is given that $x - y \leq 3$

So the linear equation is

$x - y = 3$

Let us draw the line $x - y = 3$

If $x = 0$ we get

$0 - y = 3$

$y = -3$

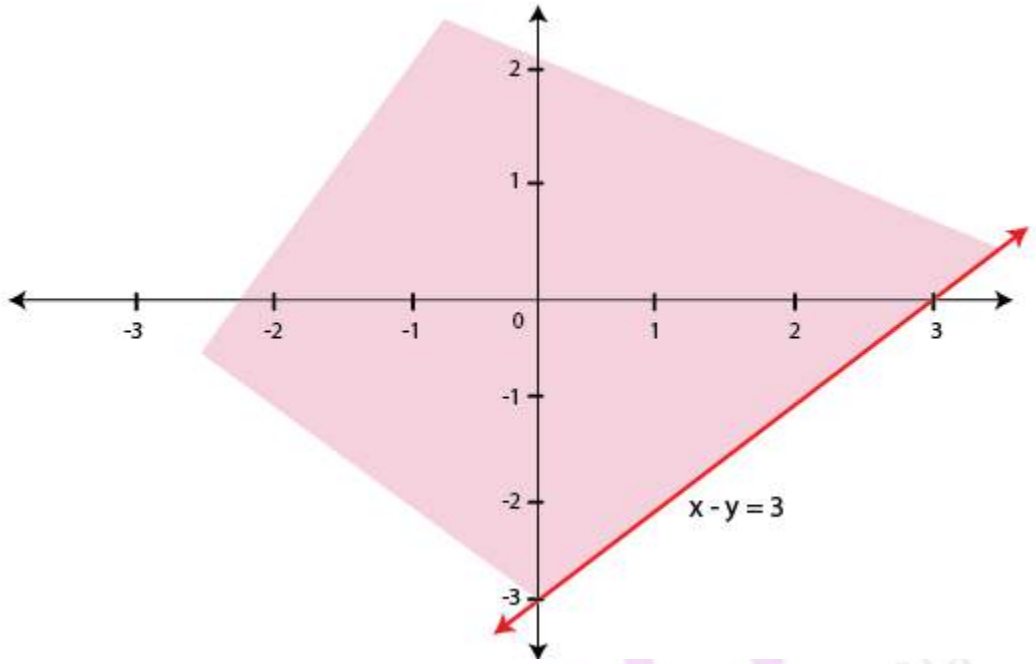
If $y = 0$ we get

$x - 0 = 3$

$x = 3$

So the points (0, 4) and (4, 0) are on the line

Now by putting (0, 0) in $x - y \leq 3$ is true



Therefore, the shaded region towards origin including line $x - y = 3$.

3.

Solution:

It is given that $x + 2y > 1$

So the linear equation is

$x + 2y = 1$

Let us draw the line $x + 2y = 1$

If $x = 0$ we get

$0 + 2y = 1$

$y = 1/2$

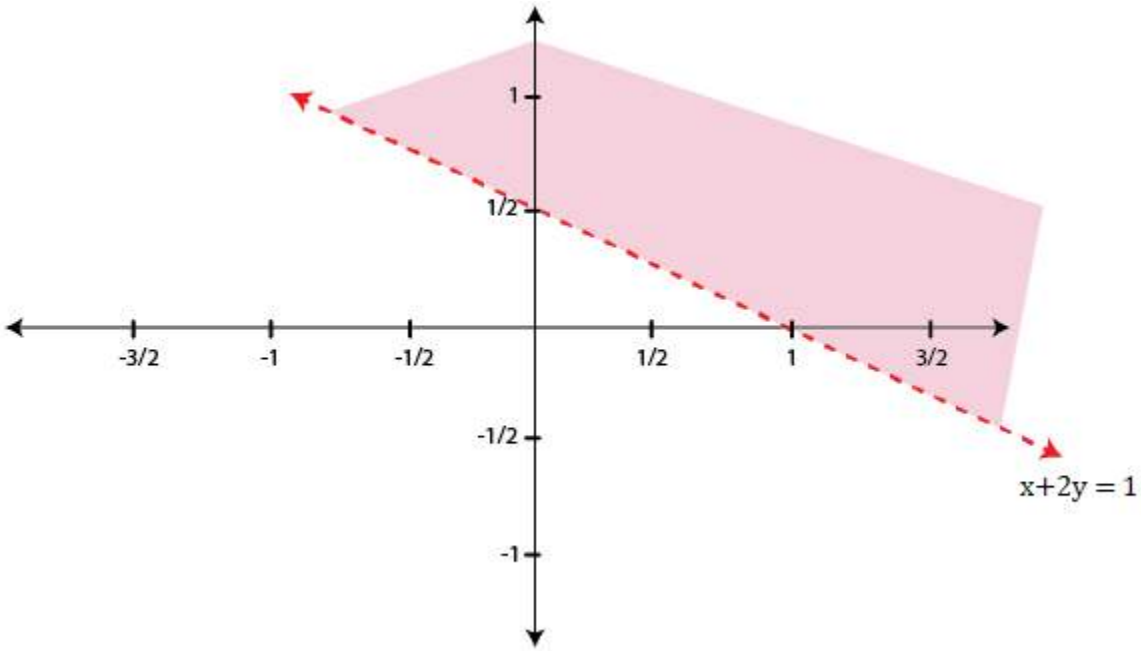
If $y = 0$ we get

$x + 2(0) = 1$

$x = 1$

So the points (0, 1/2) and (1, 0) are on the line

Now by putting (0, 0) in x + 2y > 1is false



Therefore, the shaded region above the line x + 2y = 1.

4.

Solution:

It is given that 2x – 3y < 4

So the linear equation is

2x – 3y = 4

Let us draw the line 2x – 3y = 4

If x = 0 we get

2 (0) – 3y = 4

y = - 4/3

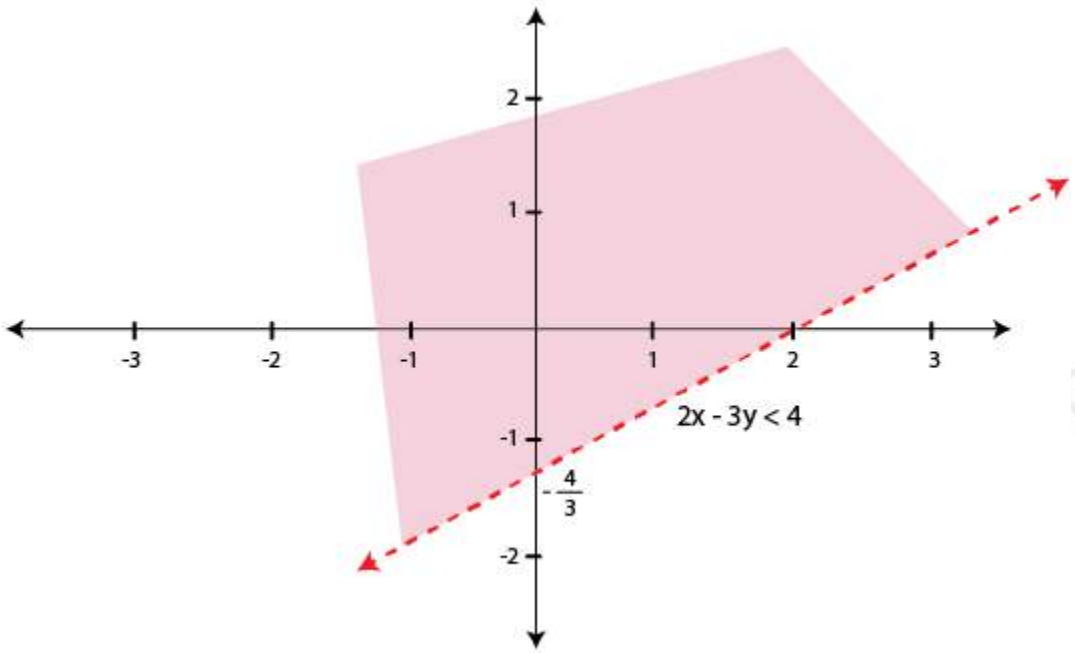
If y = 0 we get

2x – 3 (0) = 4

x = 2

So the points (0, - 4/3) and (2, 0) are on the line

Now by putting (0, 0) in 2x – 3y < 4 is true



Therefore, shaded region above the line 2x – 3y = 4.

5.

Solution:

It is given that x ≥ y – 2

So the linear equation is

x = y – 2

Let us draw the line x = y – 2

If x = 0 we get

0 = y – 2

y = 2

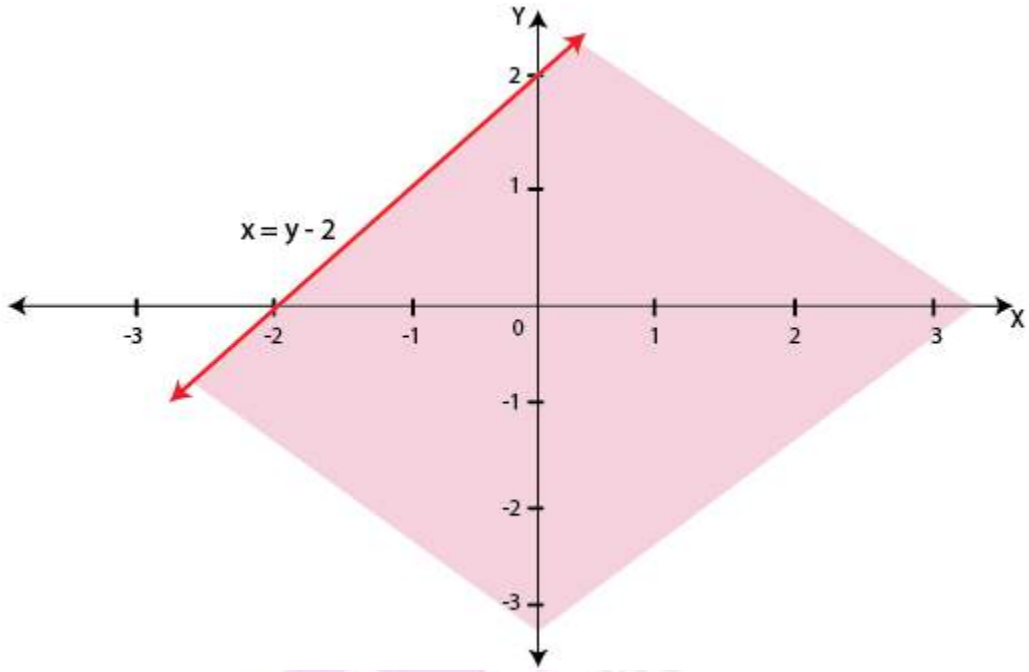
If y = 0 we get

x = 0 – 2

x = - 2

So the points (0, 2) and (-2, 0) are on the line

Now by putting (0, 0) in x ≥ y – 2 is true



Therefore, shaded region towards origin including line x = y – 2.