

## Step-1

*Feasible set:* A feasible set is composed of the solutions to a family of linear inequalities, and a feasible point maximizes or minimizes a certain cost function.

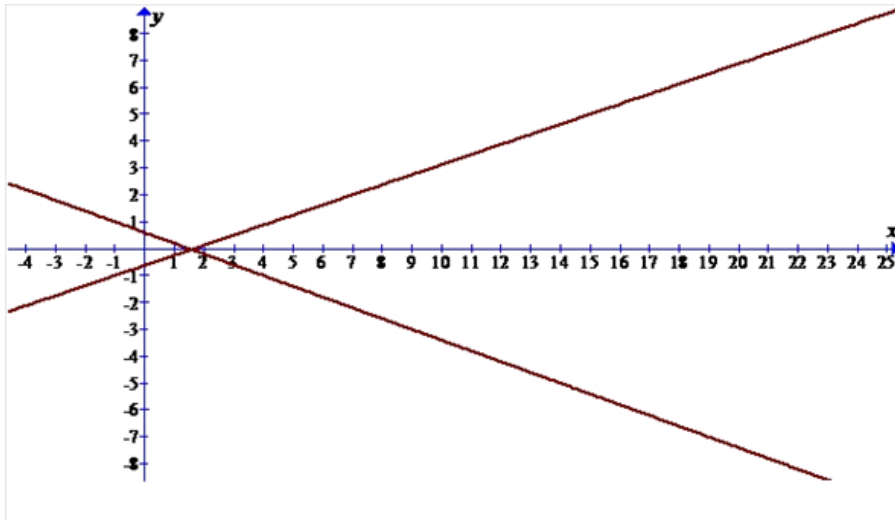
## Step-2

To show that the feasible set with following constraints is empty.

$$\begin{aligned}2x + 5y &\leq 3 \\ -3x + 8y &\leq -5 \\ x &\geq 0 \\ y &\geq 0\end{aligned}$$

## Step-3

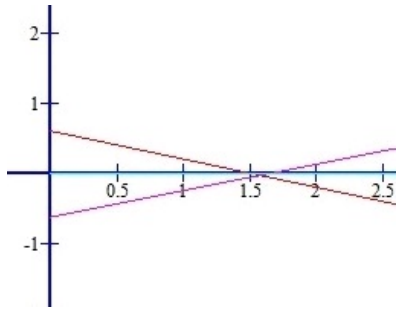
Following sketch gives the feasible set:



Here no shaded region denotes the feasible region is empty.

## Step-4

Enlarged view of the intersection shown above.



Clearly, the intersection of these two lines is below the  $x$  axis this shows that  $y$  is negative. This is in contradiction with mentioned constraints.

## Step-5

Mathematically, after solving the two equations value of  $y$  is:

## Step-6

$$3 \times (2x + 5y) = 3 \times 3$$

$$2 \times (-3x + 8y) = 2 \times (-5)$$

## Step-7

Solve it further:

## Step-8

$$6x + 15y = 9$$

$$-6x + 16y = -10$$

$$y = \frac{-1}{31}$$

## Step-9

This also shows that value of  $y$  is negative.

## Step-10

Therefore, the feasible set will be empty.