

Step-1

Let us consider the following linear programming problem

Maximize: y_2

Subject to following constraints

$$y_1 \geq 0$$

$$y_2 \geq 0$$

$$y_1 + y_2 \leq 3$$

Step-2

Let us find the dual of the LPP problem by introducing the dual unknown x_1 and x_2 .

Minimization in the Primal becomes maximization in the dual.

Thus, the dual of the problem is as follows.

Minimize: $3x_2$

Subject to following constraints

$$x_1 \geq 0$$

$$x_2 \geq 0$$

$$x_1 \leq 0$$

$$x_2 \leq 1$$

Step-3

Let us solve the primal problem by converting the inequality into equations.

$$y_1 + y_2 = 3$$

It gives, $y_1 = 3$ and $y_2 = 0$ or $y_1 = 0$ and $y_2 = 3$

And the maximum cost is $\boxed{c_1 = 3}$

Step-4

Let us solve the dual problem by converting the inequality into equations.

$$x_1^* = 0$$

$$x_2^* = 1$$

And the minimum cost is $c_2 = 3$

Step-5

Therefore, it is observed that the primal and the corresponding dual have the same solution.