Algorithm and examples

Method 6. Primal to Dual

Solve the Linear programming problem using Primal to dual conversion calculator

Type your linear programming problem

```
MAX Z = 5x1 + 6x2
subject to
x1 + 9x2 <= 60
2x1 + 3x2 <= 45
5x1 - 2x2 <= 20
x2 <= 30
```

OR

Total Variables : 2 Total Constraints : 5 Generate

Max Z = 5 x1 + 6 x2

Subject to constraints

1 x1 + 9 x2 <= 60

2 x1 + 3 x2 <= 45

5 x1 + -2 x2 <= 20

0 x1 + 1 x2 <= 30

4 x1 + 7 x2 >= 2

and x1,x2 >= 0 and unrestricted in sign ☐ x1, ☐ x2

Mode : Decimal

Find Random New

Solution Help

Solution will be displayed step by step (In 2 parts)

Solution

Find dual from primal conversion
MAX Z = 5x1 + 6x2
subject to
x1 + 9x2 <= 60
2x1 + 3x2 <= 45
5x1 - 2x2 <= 20
x2 <= 30
4x1 + 7x2 >= 2
and x1,x2 >= 0

Solution:
Primal is (Solution steps of Primal by **BigM method**)

MAX $Z_x = 5x_1 + 6x_2$

subject to

$x_1 + 9x_2 \le 60$

$2x_1 + 3x_2 \le 45$

$5x_1 - 2x_2 \le 20$

$x_2 \le 30$

$4x_1 + 7x_2 \ge 2$

and $x_1, x_2 \ge 0;$

all $\ge$ constraints can be converted to $\le$ type by multipling both sides by -1

MAX $Z_x = 5x_1 + 6x_2$

subject to

$x_1 + 9x_2 \le 60$

$2x_1 + 3x_2 \le 45$

$$5x_1 - 2x_2 \le 20$$
$$x_2 \le 30$$
$$-4x_1 - 7x_2 \le -2$$
and $x_1, x_2 \ge 0$;

Dual is (Solution steps of Dual by **BigM method**)

MIN $Z_y = 60y_1 + 45y_2 + 20y_3 + 30y_4 - 2y_5$
subject to
$$y_1 + 2y_2 + 5y_3 - 4y_5 \ge 5$$
$$9y_1 + 3y_2 - 2y_3 + y_4 - 7y_5 \ge 6$$
and $y_1, y_2, y_3, y_4, y_5 \ge 0$;

Solution provided by AtoZmath.com

Any wrong solution, solution improvement, feedback then **Submit Here**

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