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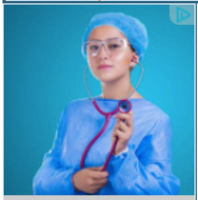

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Home > Operation Research calculators > Graphical method calculator

Algorithm and examples

Method 5. Graphical method

Solve the Linear programming problem using Graphical method calculator

Type your linear programming problem

```
MAX Z = 15x1 + 10x2
subject to
4x1 + 6x2 <= 360
3x1 >= 180
and x1,x2 >= 0
```

OR

Total Variables : 2 Total Constraints : 2 Generate

Max Z = 15 x1 + 10 x2

Subject to constraints

4 x1 + 6 x2 <= 360

3 x1 + 0 x2 >= 180

and x1,x2 >= 0

Mode : Decimal

Find Random New

Solution Help

Solution

Find solution using graphical method
MAX Z = 15x1 + 10x2
subject to
4x1 + 6x2 <= 360
3x1 >= 180
and x1,x2 >= 0

Solution:
Problem is

MAX $Z_x = 15x_1 + 10x_2$

subject to

$4x_1 + 6x_2 \le 360$

$3x_1 \ge 180$

and $x_1, x_2 \ge 0$;

Hint to draw constraints

1. To draw constraint $4x_1 + 6x_2 \le 360 \to (1)$

Treat it as $4x_1 + 6x_2 = 360$

When $x_1 = 0$ then $x_2 = ?$

$\Rightarrow 4(0) + 6x_2 = 360$

$\Rightarrow 6x_2 = 360$

$\Rightarrow x_2 = \frac{360}{6} = 60$

When $x_2 = 0$ then $x_1 = ?$

$\Rightarrow 4x_1 + 6(0) = 360$

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$\Rightarrow 4x_1 + 6(0) = 360$

$\Rightarrow 4x_1 = 360$

$\Rightarrow x_1 = \frac{360}{4} = 90$

x_1	0	90
x_2	60	0

---

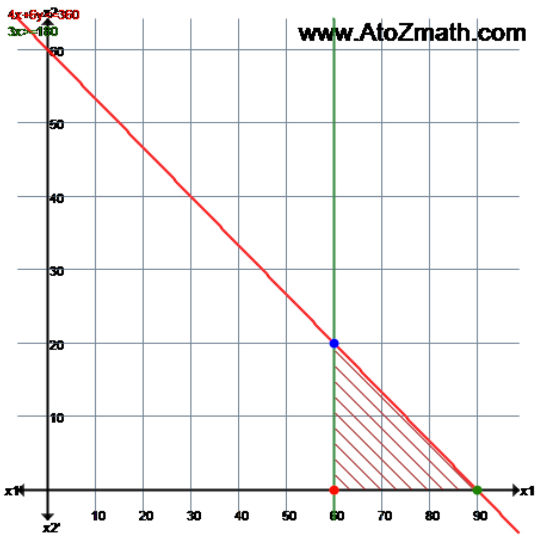
2. To draw constraint $3x_1 \geq 180 \rightarrow (2)$

Treat it as $3x_1 = 180$

$\Rightarrow x_1 = \frac{180}{3} = 60$

Here line is parallel to Y-axis

x_1	60	60
x_2	0	1



The value of the objective function at each of these extreme points is as follows:

Extreme Point Coordinates (x_1,x_2)	Lines through Extreme Point	Objective function value $Z = 15x_1 + 10x_2$
$A(60, 0)$	$2 \rightarrow 3x_1 \geq 180$ $4 \rightarrow x_2 \geq 0$	$15(60) + 10(0) = 900$
$B(90, 0)$	$1 \rightarrow 4x_1 + 6x_2 \leq 360$ $4 \rightarrow x_2 \geq 0$	$15(90) + 10(0) = 1350$
$C(60, 20)$	$1 \rightarrow 4x_1 + 6x_2 \leq 360$ $2 \rightarrow 3x_1 \geq 180$	$15(60) + 10(20) = 1100$

The maximum value of the objective function $Z = 1350$ occurs at the extreme point $(90, 0)$.

Hence, the optimal solution to the given LP problem is : $x_1 = 90, x_2 = 0$ and max $Z = 1350$.

Solution provided by AtoZmath.com

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Xmin	0	Xmax	100
Ymin	0	Ymax	65
Gridlines X:	10	Gridlines Y:	10
Redraw			

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