

6C Optimal Points

To solve a linear programming problem, you need to find the point in the feasible region that maximises or minimises the objective function.

- This can be done by the objective line method or ruler method. We can finally use a set square!
1. Nigel is making ice cream for sale at a charity fair. He makes two flavours of ice cream: vanilla and chocolate. Let the number of litres of vanilla ice cream made be x and the number of litres of chocolate ice cream made be y . Nigel decides to use linear programming to determine the number of litres of each type of ice cream he should make. The constraints and the feasible region are illustrated in the diagram below.



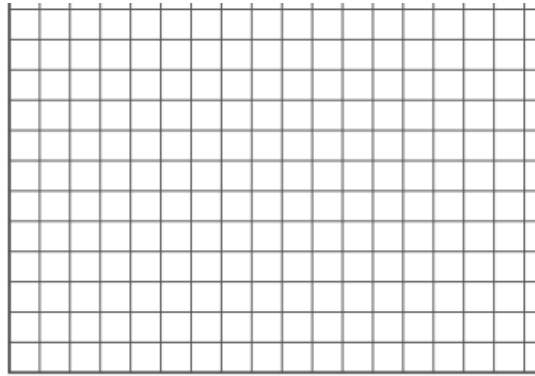
Determine the optimal solution for this problem, given the objective is to

- a) Maximise the profit on sales,
- b) Minimise the production costs,

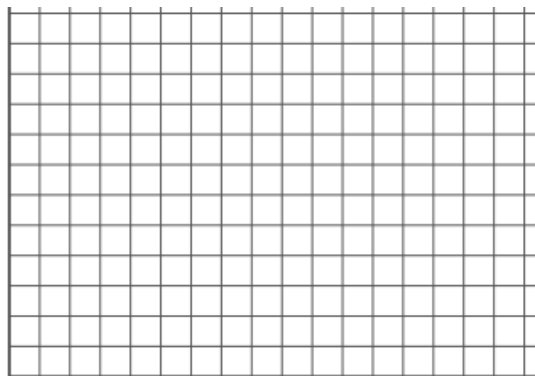
2. Using the feasible region determined by the inequalities

find the optimal point and the optimal value when the objective is to:

a) Maximise



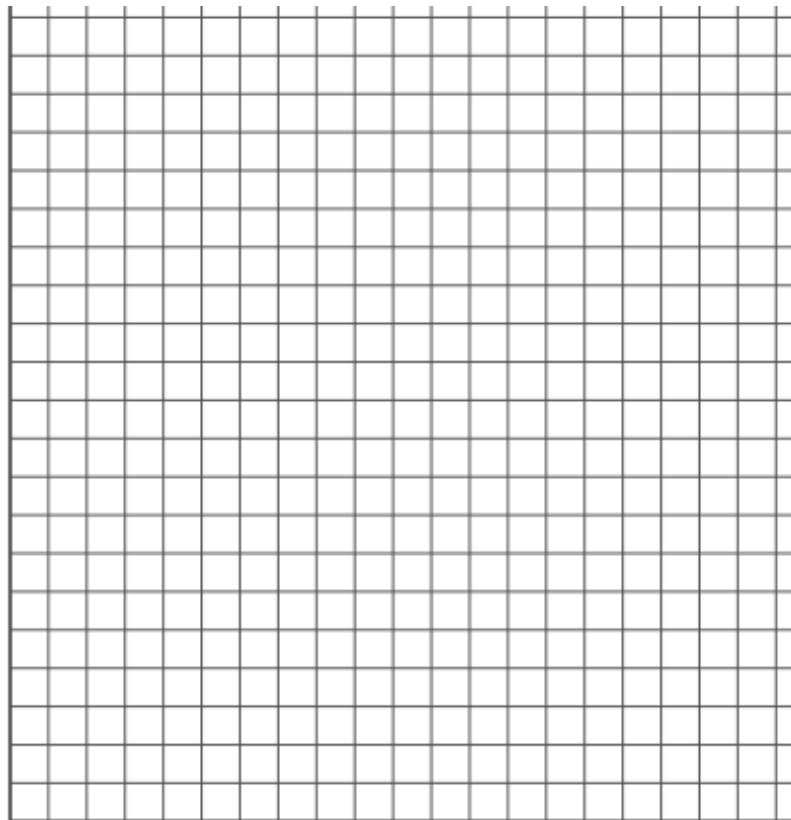
b) Minimise



3. In a linear programming problem the constraints are given by:

a) Minimise

b) Minimise



c) Find an optimal solution given that the objective function is to minimise

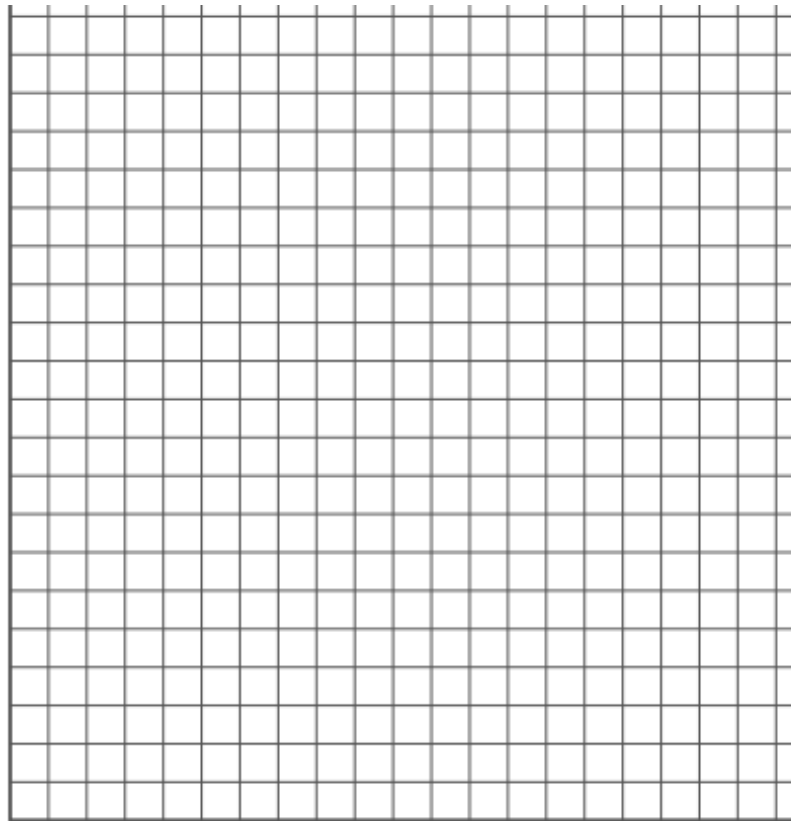
Vertex Method:

- First find the coordinates of each vertex of the feasible region.
- Evaluate the objective function at each of these points.
- Select the vertex that gives the optimal value of the objective function.

4. Use the vertex testing method to solve the following linear programming problem:

Minimise:

Subject to



5. A feasible region is defined by the following constraints:

Find the optimal point and optimal value given that the objective is:

a) Maximise

b) Minimise

