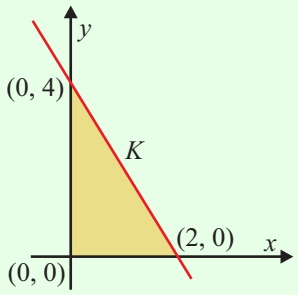
LINEAR PROGRAMMING (Q 11, PAPER 2)

2000

11 (a) The line K passes through the points (2, 0) and (0, 4).



(i) Find the equation of the line K.

(ii) Write down three inequalities which define the shaded region in the diagram.

(b) Two types of machines, type A and type B, can be purchased for a new factory. Each machine of type A costs IR£1600. Each machine of type B costs IR£800. The purchase of the machines can cost, at most, IR£27,200.

Each machine of type A needs 90 m^2 of floor space in the factory.
Each machine of type B needs 54 m^2 of floor space.

The maximum amount of floor space available for the machines is 1620 m^2.

(i) If x represents the number of machines of type A and y represents the number of machines of type B, write down two inequalities in x and y and illustrate these on graph paper.

(ii) The daily income from the use of each machine of type A is IR£75. The daily income from the use of each machine of type B machine is IR£42. How many of each type of machine should be purchased so as to maximise daily income?

(iii) What is the maximum daily income?

ANSWERS

11 (a) (i) $2x + y = 4$

(ii) $2x + y \leq 4,\ x \geq 0,\ y \geq 0$

(b) (i) $2x + y \leq 34,\ 5x + 3y \leq 90$

(ii) A = 12, B = 10

(iii) £1230