

LINEAR PROGRAMMING (Q 11, PAPER 2)

1998

- 11 (a) Write down the coordinates of two points on the line $2x + 3y = 18$.

On a diagram, illustrate the set of points (x, y) that satisfy simultaneously the three inequalities

$$2x + 3y \leq 18$$

$$x \geq 3$$

$$y \geq 2.$$

- (b) A company produces two products, A and B.

Each unit of the two products must be processed on two assembly lines, the red line and the blue line, for a certain length of time.

Each unit of A requires 3 hours on the red line and 1 hour on the blue line.

Each unit of B requires 1 hour on the red line and 2 hours on the blue line.

Each week, the maximum time available on the red line is 60 hours and the maximum time available on the blue line is 40 hours.

- (i) If x represents the number of units of A produced in a week and y represents the number of units of B produced in a week, write down two inequalities in x and y . Illustrate these on graph paper.
- (ii) The profit made on each unit of A is twice the profit made on each unit of B. How many units of each product must be manufactured in a week so as to maximise the profit?
- (iii) If the maximum profit that can be made in a week is IR£1980, calculate the profit made on each unit of A and on each unit of B.

ANSWERS

11 (a) (0, 6), (9, 0)

(b) (i) $3x + y \leq 60$, $x + 2y \leq 40$

(ii) 16 of A and 12 of B

(iii) A: £90; B: £45