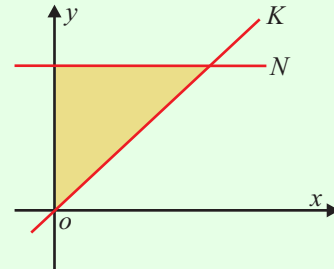


LINEAR PROGRAMMING (Q 11, PAPER 2)

1996

- 11 (a) The equation of the line K is $y - x = 0$
and the equation of the line N is $y - 4 = 0$.



- (i) Write down the three inequalities which define the triangular region indicated in the diagram.
- (ii) In a diagram, illustrate the set of points (x, y) that satisfy $y - 4 \geq 0$, $y - x \leq 0$ and $x - 6 \leq 0$.

- (b) A property developer wishes to construct a business centre consisting of shops and offices. The floor space required for each shop is 60 m^2 and for each office is 20 m^2 . The total floor space for the business centre cannot exceed 960 m^2 .

The construction of each shop takes 5 working days to complete and each office 3 working days to complete. The developer has at most 120 working days to complete the construction.

- (i) If the developer constructs x shops and y offices, write two inequalities in x and y and illustrate these on graph paper.
- (ii) If the rental charge is IR£200 per m^2 for a shop and IR£140 per m^2 for an office, how many of each type should be built so as to maximize the developer's rental income? Find this maximum rental income.
- (iii) If each shop provides 7 jobs and each office 3 jobs, write an expression in x and y for the total number of jobs to be provided. How many of each type should be built so as to maximize the number of jobs?

ANSWERS

- 11 (a) (i) $y - x \geq 0$, $y - 4 \leq 0$, $x \geq 0$
(b) (i) $3x + y \leq 48$, $5x + 3y \leq 120$
(ii) $x = 0$, $y = 40$; £5600
(iii) $x = 0$, $y = 40$