Linear Programming (Q 11, Paper 2)

2001

11 (a) Using graph paper, illustrate the set of points (that simultaneously satisfy the three inequalities:

$$y \geq 2$$
$$x + 2y \leq 8$$
$$5x + y \geq -5.$$

(b) Houses are to be built on 9 hectares of land.
Two types of houses, bungalows and semi-detached houses, are possible.

Each bungalow occupies one fifth of a hectare.
Each semi-detached house occupies one tenth of a hectare.

The cost of building a bungalow is IR£80 000.
The cost of building a semi-detached house is IR£50 000.
The total cost of building the houses cannot be greater than IR£4 million.

(i) Taking x to represent the number of bungalows and y to represent the number of semi-detached houses, write down two inequalities in x and y and illustrate these on graph paper.

(ii) The profit on each bungalow is IR£10 000. The profit on each semi-detached house is IR£7000. How many of each type of house should be built so as to maximise profit?

Answers

11 (b) (i) $2x + y \leq 90$, $8x + 5y \leq 400$
(ii) $x = 0$, $y = 80$