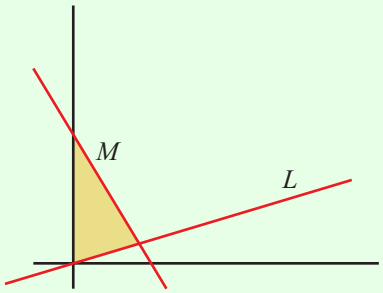
# Linear Programming (Q 11, Paper 2)

## 2004

11 (a) The equation of the line $L$ is $x - 2y = 0$.
The equation of the line $M$ is $2x + y = 4$.
Write down the three inequalities that together define the shaded region in the diagram.




(b) A shop-owner displays videos and DVDs in his shop.
Each video requires 720 cm$^3$ of display space and each DVD requires 360 cm$^3$ of display space. The available display space cannot exceed 108 000 cm$^3$. The shopowner buys each video for €6 and each DVD for €8. He does not wish to spend more than €1200.

(i) Taking $x$ as the number of videos and $y$ as the number of DVDs, write down two inequalities in $x$ and $y$ and illustrate these on graph paper.

During a DVD promotion the selling price of a video is €11 and of a DVD is €10. Assuming that the shop-owner can sell all the videos and DVDs,

(ii) how many of each type should he display in order to maximise his income?

(iii) how many of each type should he display in order to maximise his profit?

**Answers**

11 (a) $x - 2y \le 0,\ x \ge 0,\ 2x + y \le 4$

(b) (i) $2x + y \le 300,\ 3x + 4y \le 600$

(ii) $x = 120,\ y = 60$

(iii) $x = 150,\ y = 0$