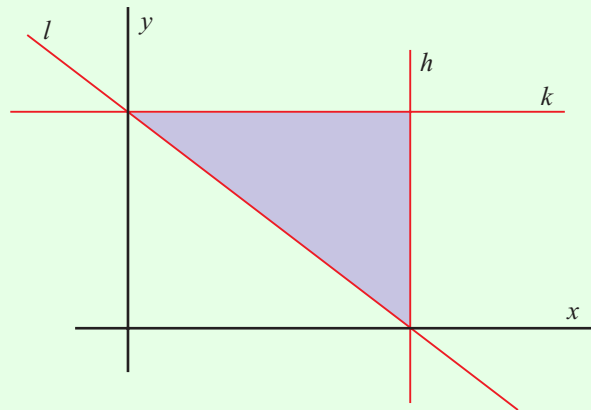


LINEAR PROGRAMMING (Q 11, PAPER 2)

2011

- 11. (a)** The diagram shows the lines
 $l: 2x + 3y - 6 = 0$,
 $h: x - 3 = 0$ and $k: y - 2 = 0$.
Write down the three inequalities
that together define the shaded
region in the diagram.



- (b)** A garage is starting a van rental business. The garage will rent out two types of vans, small vans and large vans.

To set up the business, each small van costs €20 000 and each large van costs €40 000. The garage has at most €800 000 to purchase the vans.

Each small van requires 18 m² of parking space and each large van requires 24 m² of parking space. The garage has at most 576 m² of parking space available for the vans.

- (i)** Taking x as the number of small vans and y as the number of large vans, write down two inequalities in x and y and illustrate these on graph paper.
- (ii)** The garage charges €40 a day to rent a small van and €50 a day to rent a large van. How many of each should the garage rent to maximise rental income, assuming that all vans are rented.
- (iii)** The garage incurs daily expenses of €12 for each van. Calculate the maximum daily profit from renting the vans.

ANSWERS

- 11 (a) $x \leq 3$, $y \leq 2$, $2x + 3y - 6 \geq 0$
(b) (i) $x + 2y \leq 40$, $3x + 4y \leq 96$ (ii) 32 small vans
(iii) €896