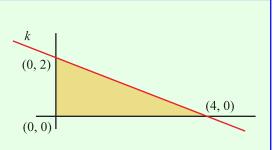
LINEAR PROGRAMMING (Q 11, PAPER 2)

2010

- 11 (a) The line k passes through the points (0, 2) and (4, 0).
 - (i) Find the equation of *k*.
 - (ii) Write down the three inequalities which define the shaded region in the diagram.



(b) A contractor has the task of loading containers onto a truck. There are two types of container: heavy containers which weigh 160 kg each and light containers which weigh 40 kg each. The truck can carry, at most, a total weight of 2080 kg.

The time taken to load a heavy container is 3 minutes. The time taken to load a light container is 2 minutes. The total time spent loading a truck cannot be greater than 54 minutes.

- (i) Taking *x* as the number of heavy containers and *y* as the number of light containers, write down two inequalities in *x* and *y* and illustrate these on graph paper.
- (ii) The contractor charges €48 to load each heavy container and €36 to load each light container. How many of each should be loaded in order to maximise income?
- (iii) On your graph, show the region where the income is at most €576.

Answers 11 (a) (i) x + 2y - 4 = 0 (ii) $x \ge 0$, $y \ge 0$, $x + 2y - 4 \le 0$ (b) (i) $4x + y \le 52$, $3x + 2y \le 54$ (ii) x = 0, y = 27