## 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) $x+2 y-4=0$
(ii) $x \geq 0, y \geq 0, x+2 y-4 \leq 0$
(b) (i) $4 x+y \leq 52,3 x+2 y \leq 54$
(ii) $x=0, y=27$

