Graphs & Finding regions Difficulty: Easy

Question Paper 1

Level	AS & A Level
Subject	Maths - Pure
Exam Board	Edexcel
Topic	Equations and inequalities
Sub-Topic	Graphs & Finding regions
Difficulty	Easy
Booklet	Question Paper 1

Time allowed: **40 minutes**

Score: **/33**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>76%	61%	52%	42%	33%	23%	<23%
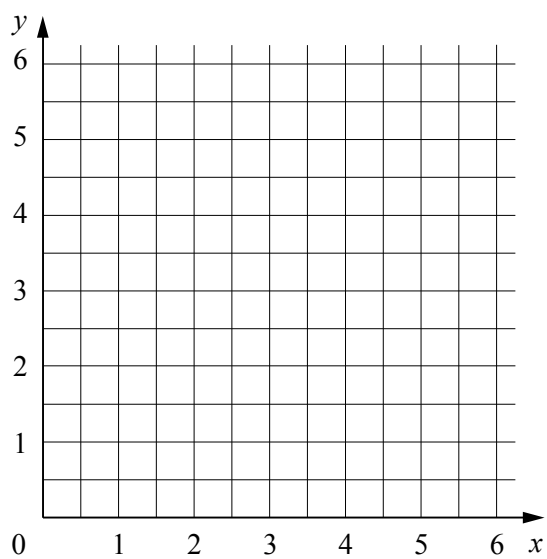
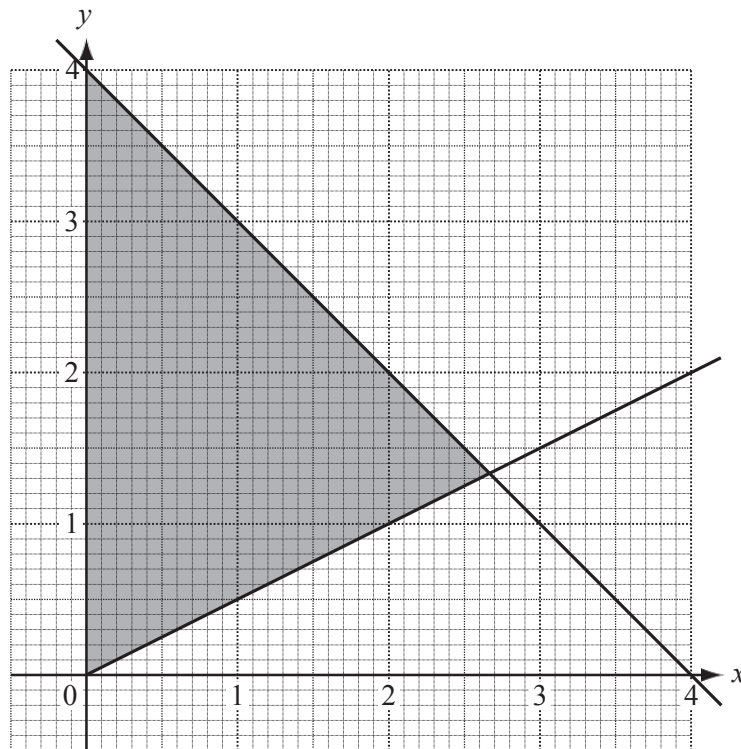(a) On the grid, draw the lines $x = 1$, $y = 2$ and $x + y = 5$.   [3]

(b) Write R in the region where $x \geqslant 1$, $y \geqslant 2$ and $x + y \geqslant 5$.   [1]

2

Find the three inequalities which define the shaded region on the grid. [5]

A new school has x day students and y boarding students.

The fees for a day student are $600 a term.
The fees for a boarding student are $1200 a term.
The school needs at least $720 000 a term.

(a) Show that this information can be written as $x + 2y \geqslant 1200$.   [1]
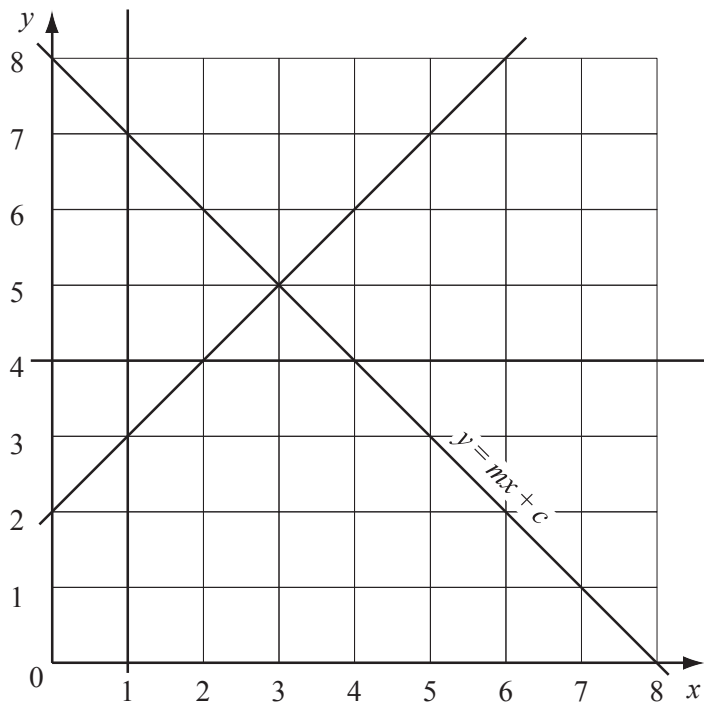
(b) The school has a maximum of 900 students.
　　Write down an inequality in x and y to show this information.   [1]

(c) Draw two lines on the grid below and write the letter **R** in the region which represents these two
　　inequalities.
                                                                                              [4]
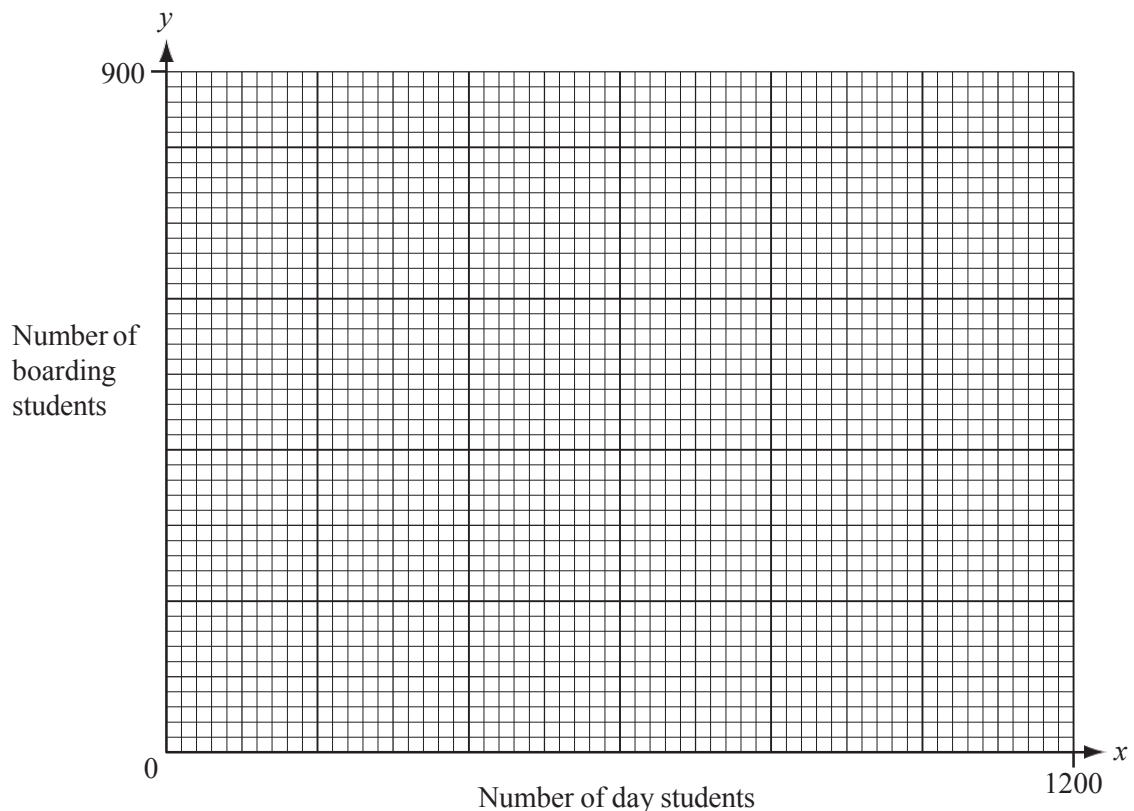
(d) What is the least number of **boarding** students at the school?   [1]

(a) One of the lines in the diagram is labelled $y = mx + c$.
    Find the values of m and c.

[1]

[1]

(b) Show, by shading all the **unwanted** regions on the diagram, the region defined by the inequalities

$$x \geqslant 1, \quad y \leqslant mx + c, \quad y \geqslant x+2 \quad \text{and} \quad y \geqslant 4.$$

Write the letter **R** in the region required. [2]

Marina goes to the shop to buy loaves of bread and cakes.
One loaf of bread costs 60 cents and one cake costs 80 cents.
She buys x loaves of bread and y cakes.

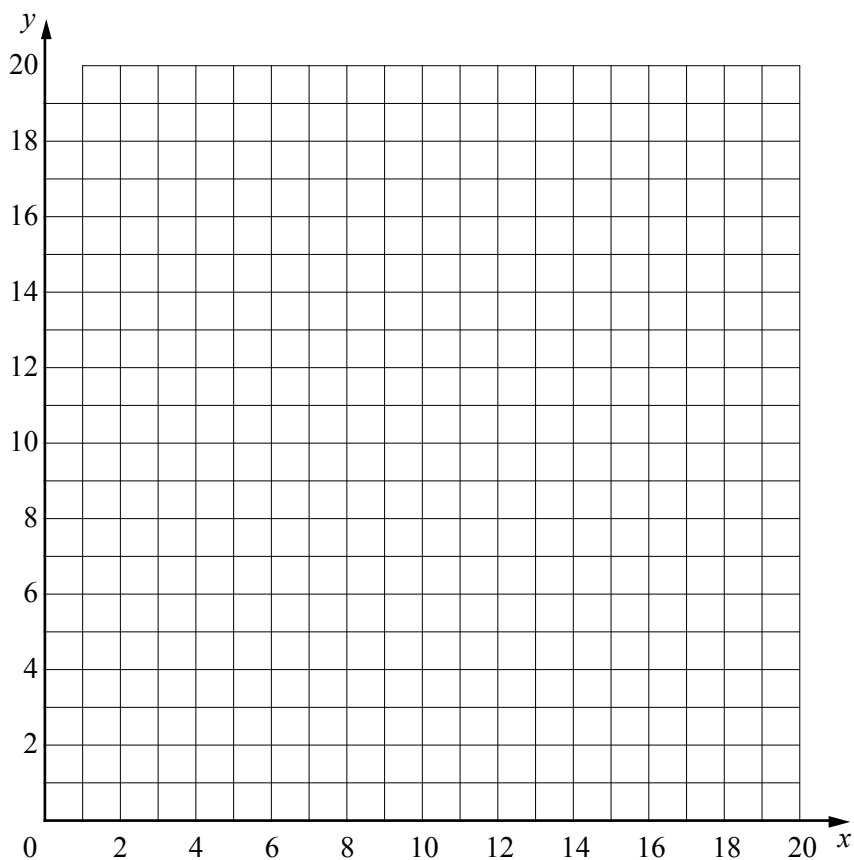(a) She must not spend more than $12.
Show that $3x + 4y \leq 60$.   [1]

(b) The number of loaves of bread must be greater than or equal to the number of cakes.
Write down an inequality in x and y to show this information.
[1]

(c) On the grid below show the two inequalities by shading the **unwanted** regions.
Write R in the required region.
[4]

(d) The **total** number of loaves of bread and cakes is $x + y$.
Find the largest possible value of $x + y$.   [1]

A ferry has a deck area of 3600 m² for parking cars and trucks. Each car takes up 20 m² of deck area and each truck takes up 80 m². On one trip, the ferry carries x cars and y trucks.
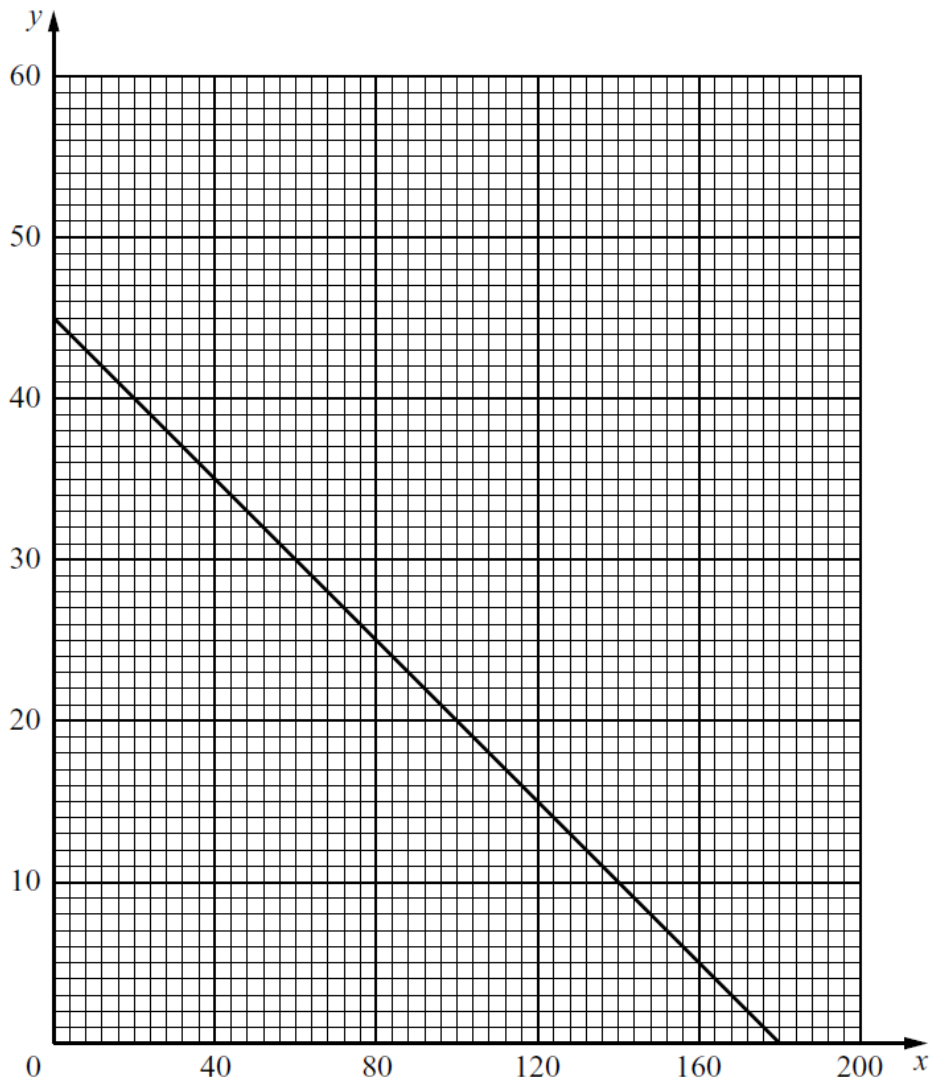
(a) Show that this information leads to the inequality $x + 4y \leq 180$. [2]

(b) The charge for the trip is \$25 for a car and \$50 for a truck.
The total amount of money taken is \$3000.
Write down an equation to represent this information and simplify it. [2]

(c)   The line $x + 4y = 180$ is drawn on the grid below.

    (i)   Draw, on the grid, the graph of your equation in part **(b)**.   [1]

(ii)
        Write down a possible number of cars and a possible number of trucks on the trip, which together satisfy both conditions.

                  [1]