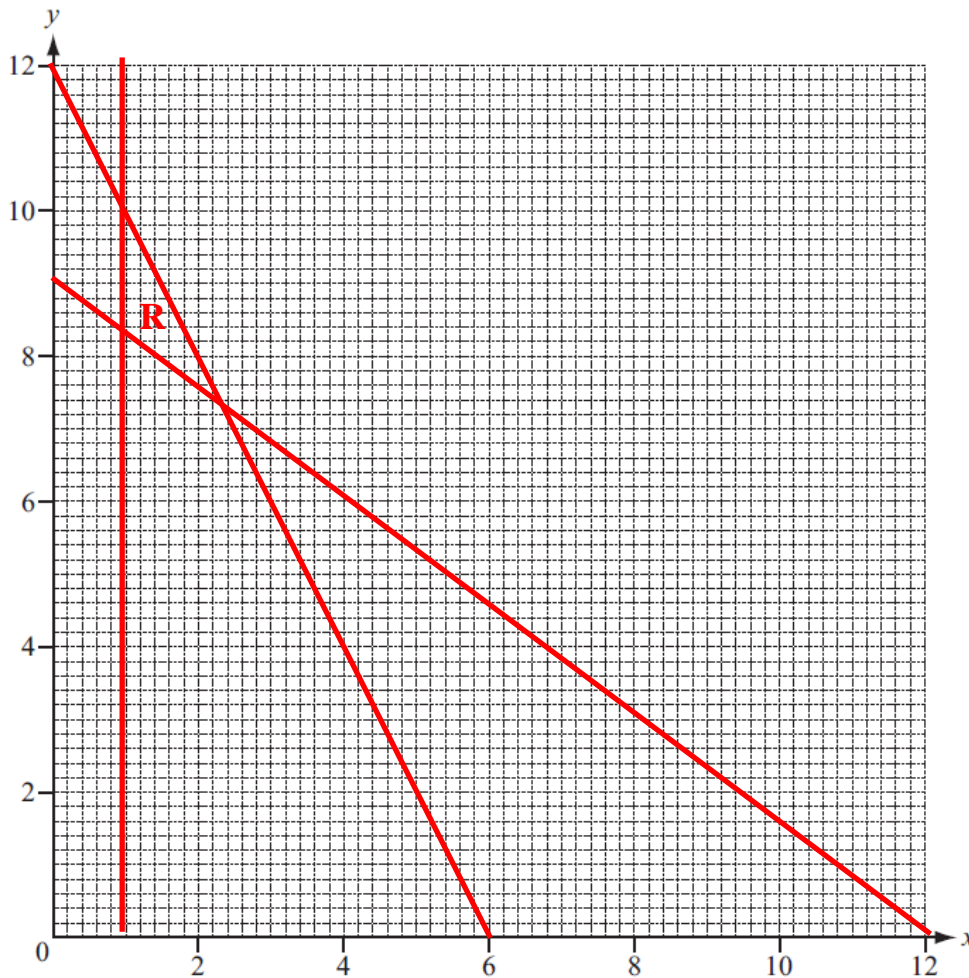




# 4.7 – Linear inequalities in the cartesian plane

Student name: \_\_\_\_\_ **Answers** \_\_\_\_\_ Score: \_\_\_\_\_

1.



(a) On the grid, draw the following lines.

$$\begin{aligned}
 &x = 1 \\
 &y = 12 - 2x \quad \text{for } 0 \leq x \leq 6 \\
 &4y + 3x = 36 \quad \text{for } 0 \leq x \leq 12
 \end{aligned}$$

[5]

(b) On the grid, label the region R containing the points which satisfy these three inequalities.

$$x \geq 1 \qquad y \leq 12 - 2x \qquad 4y + 3x \geq 36$$

[1]

(c) (i) Find the minimum value of  $x + y$  in the region R.

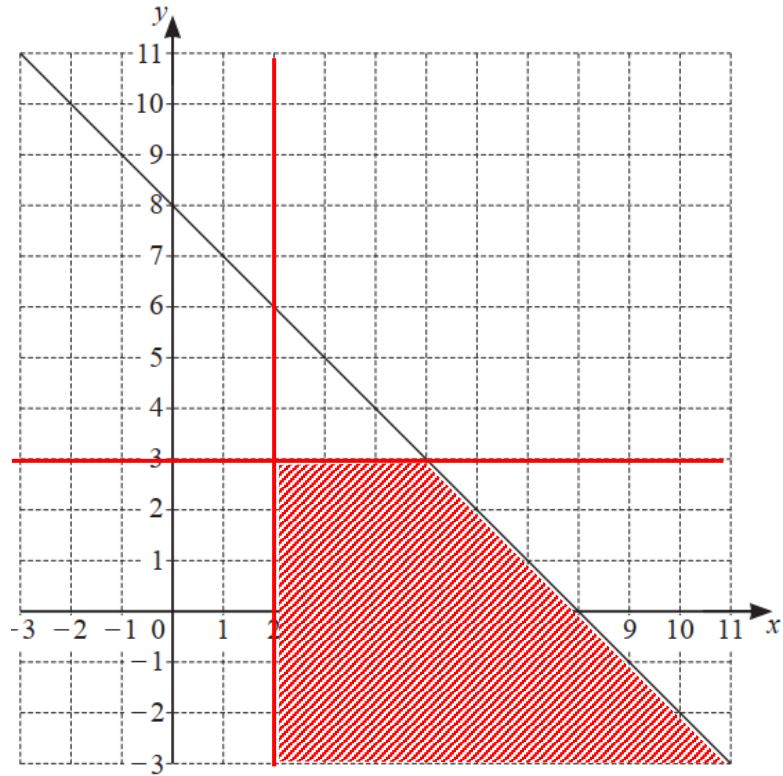
..... **9.25** ..... [1]

(ii) Find the co-ordinates of the point corresponding to this minimum value.

(... **1** ..... , **8.25** ...) [1]



2.



The diagram shows the line  $x + y = 8$ .

On the diagram, show clearly the region defined by these inequalities.

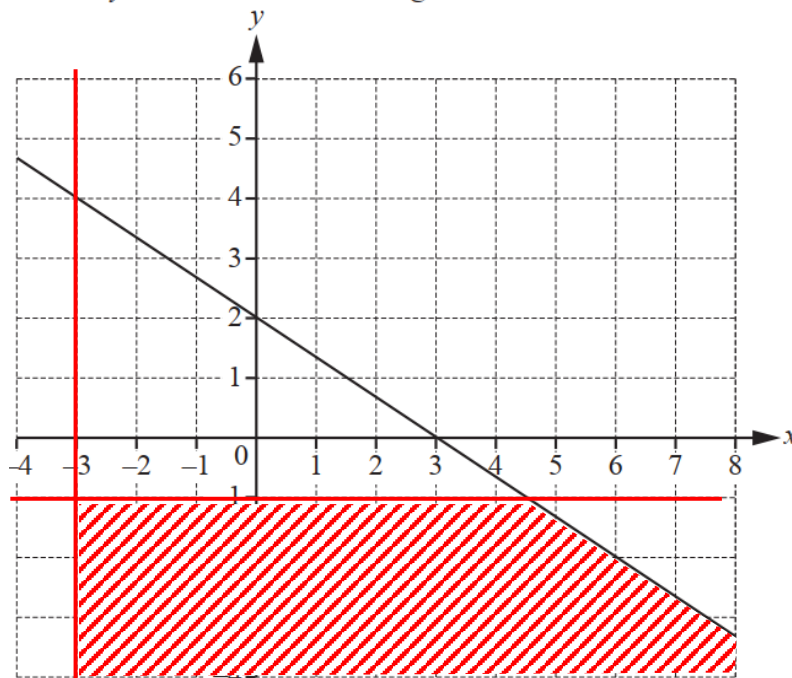
$$x + y \leq 8$$

$$x \geq 2$$

$$y \leq 3$$

[2]

3. The line with equation  $2x + 3y = 6$  is drawn on the grid.



On the grid, show clearly the **single** region defined by these three inequalities.

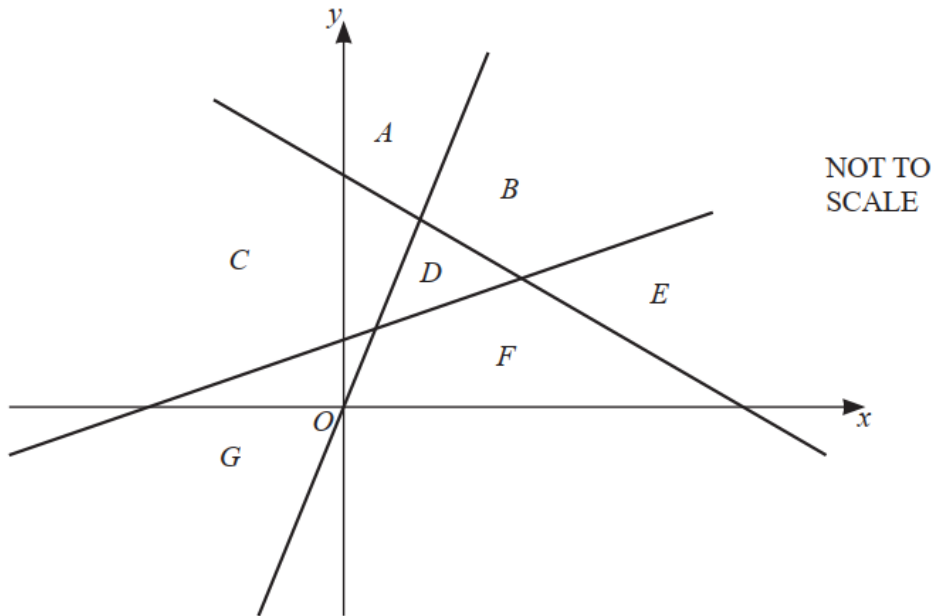
$$2x + 3y \leq 6$$

$$x \geq -3$$

$$y \leq -1$$

[3]

4.



The diagram shows the lines  $y = \frac{1}{2}x + 1$ ,  $y = 3x$  and  $3x + 4y = 12$ .

These lines divide the space into 7 regions,  $A$ ,  $B$ ,  $C$ ,  $D$ ,  $E$ ,  $F$ , and  $G$ .

Write down the letter of the region which is defined by

(a)  $y \leq \frac{1}{2}x + 1$ ,  $y \leq 3x$  and  $3x + 4y \leq 12$ ,

Region ..... **F** ..... [1]

(b)  $y \geq \frac{1}{2}x + 1$ ,  $y \geq 3x$  and  $3x + 4y \leq 12$ .

Region ..... **C** ..... [1]