

# Inequalities and Regions on Graphs

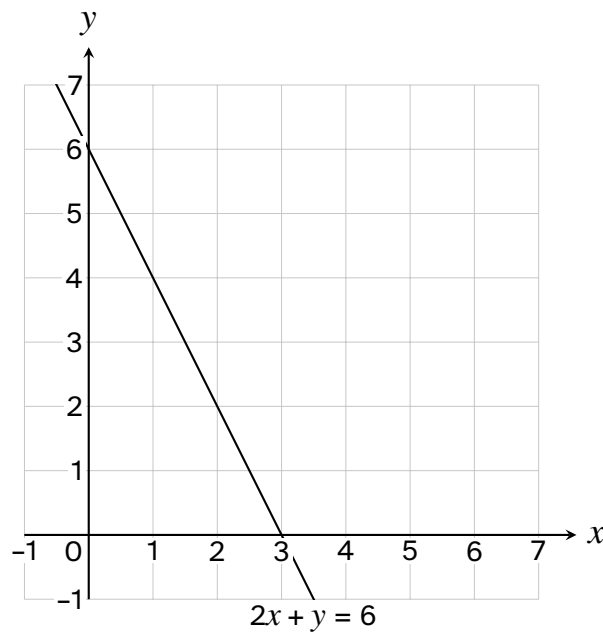
For Pearson Edexcel GCSE Mathematics (1MA1) • Higher tier

Name \_\_\_\_\_

Total marks: **25**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

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



- (a) On the grid, show by shading the region that satisfies all three of these inequalities.

$$x \geq 0 \quad y \geq 0 \quad 2x + y \leq 6$$

Label the region  $R$ .

(2)

- (b) Sam says that the point (2, 2) is in the region  $R$ .

Is Sam correct?

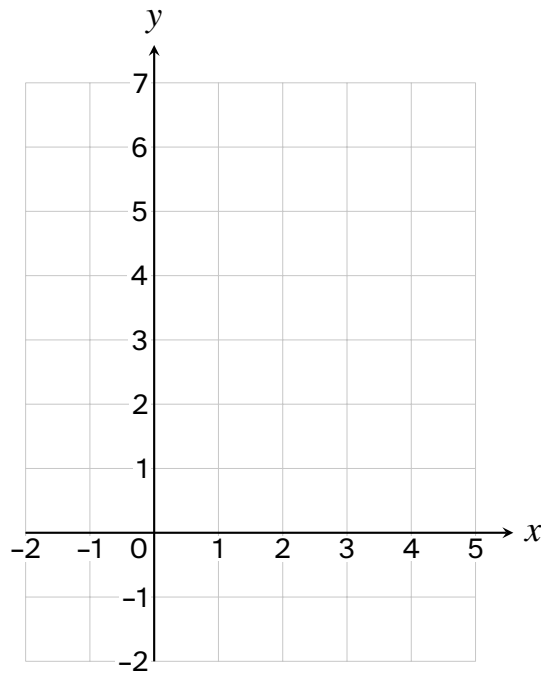
You must give a reason for your answer.

(1)

**(Total for Question 1 is 3 marks)**

- 2** On the grid, show by shading the region that satisfies all three of these inequalities.  
Label the region  $R$ .

$$y < 5 \quad y > 2x - 1 \quad 2x + y > 3$$

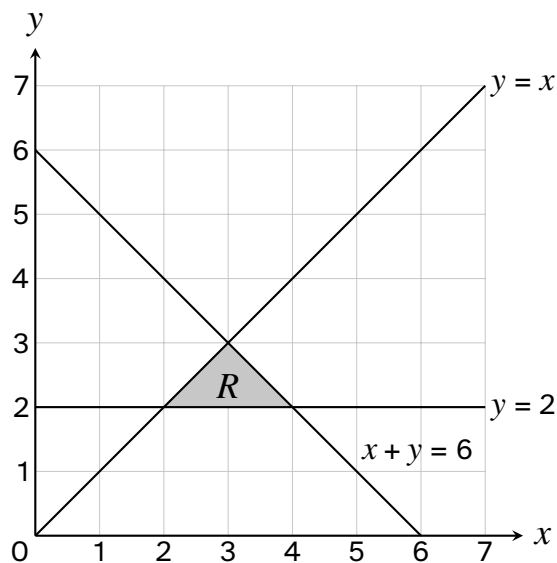


(4)

**(Total for Question 2 is 4 marks)**

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- 3 The region  $R$  is shown shaded on the grid.



Write down the three inequalities that define the region  $R$ .

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(3)

(Total for Question 3 is 3 marks)

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- 4  $x$  and  $y$  are integers.

$$x \geq 1 \quad y > x \quad x + y < 7$$

How many pairs  $(x, y)$  satisfy all three inequalities?

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(3)

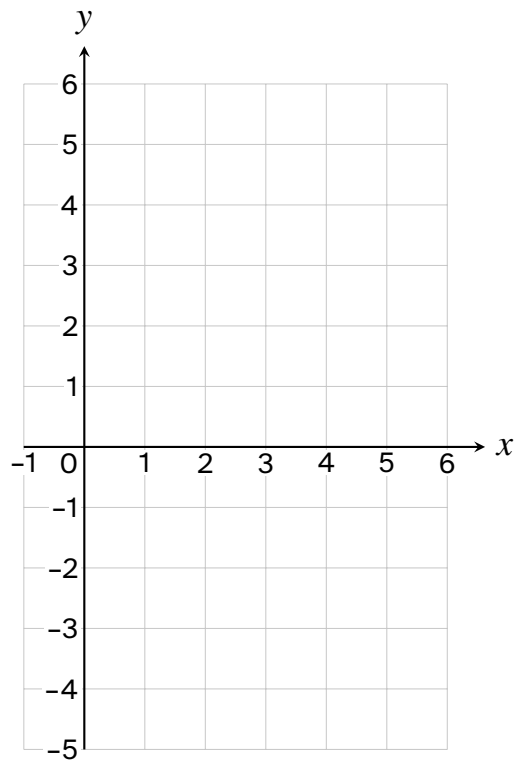
(Total for Question 4 is 3 marks)

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- 5 On the grid, show by shading the region that satisfies all three of these inequalities.

$$x \geq 2 \quad y \leq 8 - 2x \quad y \geq 2x - 8$$

Label the region  $R$ .

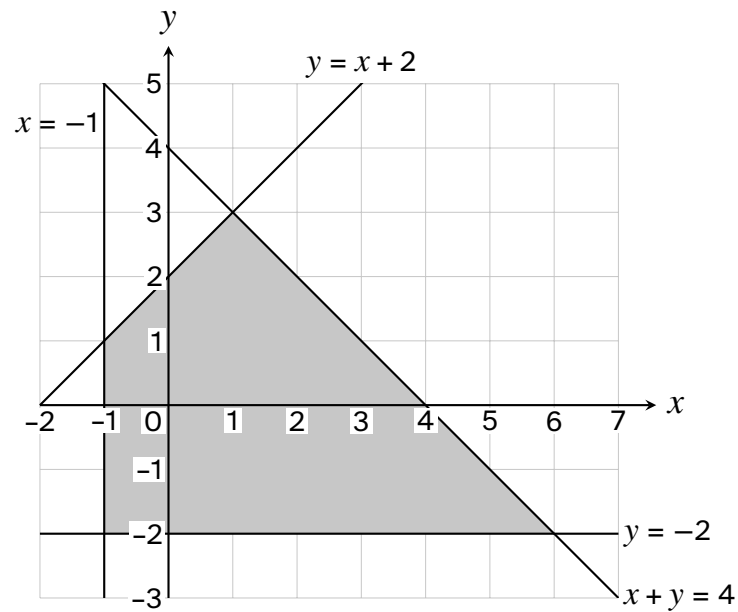


(3)

**(Total for Question 5 is 3 marks)**

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6 The diagram shows a shaded region.



Find the **four** inequalities that define the shaded region.

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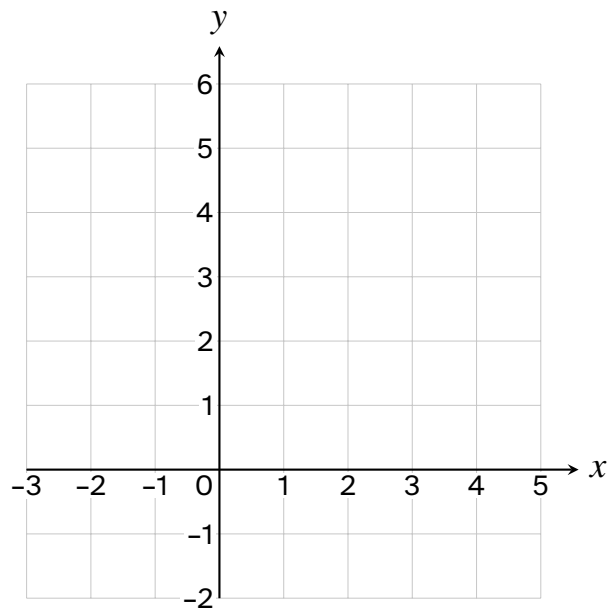
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(4)

(Total for Question 6 is 4 marks)

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- 7 (a) On the grid, show by shading the region that satisfies all of these inequalities.  
 $x \geq -2$      $x < 3$      $y > -1$      $2y \leq x + 6$   
 Label the region  $R$ .



(4)

- (b) The point  $(a, 4)$  is in the region  $R$ .  
 $a$  is an integer.  
 Find the value of  $a$ .

$a = \dots\dots\dots$   
 (1)

**(Total for Question 7 is 5 marks)**