HIGHER

6.7 Inequalities on Graphs: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A triangle has vertices (0, 2), (7, 2) and (0, 9). Write down three inequalities that together define the triangular region, including its boundary lines.

(Total for Question 1 is 3 marks)

2 A region is above the dashed line $y = 2x + 1$, below the dashed line $y = 5$, and to the right of the dashed line $x = 3$. Write down the three inequalities that define the region.

(Total for Question 2 is 3 marks)

3 A region R is defined by the inequalities $y > 2$, $2x - y \leq 2$ and $x < 6$. By substituting, decide whether each of the points A(5, 5), B(6, -1) and C(5, -1) lies inside R.

(Total for Question 3 is 3 marks)

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4 x and y are integers that satisfy $x \geq 1$, $y \geq 1$ and $x + 3y \leq 9$. Find the greatest possible value of $3x + y$.

(Total for Question 4 is 3 marks)

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5 A triangle has vertices (0, 1), (7, 1) and (0, 5). Write down three inequalities that together define the triangular region, including its boundary lines.

(Total for Question 5 is 3 marks)

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6 x and y are integers. How many points with integer coordinates satisfy all of the inequalities $x > 0$, $y > 2$ and $x + y < 9$?

(Total for Question 6 is 3 marks)

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7 A region R is defined by the inequalities $x \geq 2$, $y \leq 8$ and $x < 5$. By substituting, decide whether each of the points A(3, 8), B(-1, 6) and C(3, 2) lies inside R.

(Total for Question 7 is 3 marks)

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8 A region is above the dashed line $y = 3x$, below the dashed line $y = 6$, and to the right of the dashed line $x = 1$. Write down the three inequalities that define the region.

(Total for Question 8 is 3 marks)

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Mark scheme · 6.7 Inequalities on Graphs: 30-minute Pack

Question 1

$x \geq 0$ and $y \geq 2$	**B1**
gradient or equation of the sloping boundary found	**M1**
$x + y \leq 9$ oe	**A1**

Answer: $x \geq 0$, $y \geq 2$, $x + y \leq 9$

Question 2

$y > 2x + 1$ with correct inequality sign	**B1**
$y < 5$ with correct sign	**B1**
$x > 3$ with correct sign	**B1**

Answer: $y > 2x + 1$, $y < 5$, $x > 3$

Question 3

substitutes a point into the inequalities	**M1**
checks every inequality for each point	**M1**
A: no, B: no, C: no cao	**A1**

Answer: A: no, B: no, C: no

Question 4

identifies the region defined by the inequalities	**M1**
tests corner or boundary integer points	**M1**
19 cao	**A1**

Answer: 19

Question 5

$x \geq 0$ and $y \geq 1$	**B1**
gradient or equation of the sloping boundary found	**M1**
$4x + 7y \leq 35$ oe	**A1**

Answer: $x \geq 0$, $y \geq 1$, $4x + 7y \leq 35$

Question 6

draws or considers the three boundary lines	**M1**
counts the points row by row (or column by column)	**M1**
15 cao	**A1**

Answer: 15

Question 7

substitutes a point into the inequalities	**M1**
checks every inequality for each point	**M1**
A: yes, B: no, C: yes cao	**A1**

Answer: A: yes, B: no, C: yes

Question 8

$y > 3x$ with correct inequality sign	**B1**
$y < 6$ with correct sign	**B1**
$x > 1$ with correct sign	**B1**

Answer: $y > 3x$, $y < 6$, $x > 1$

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