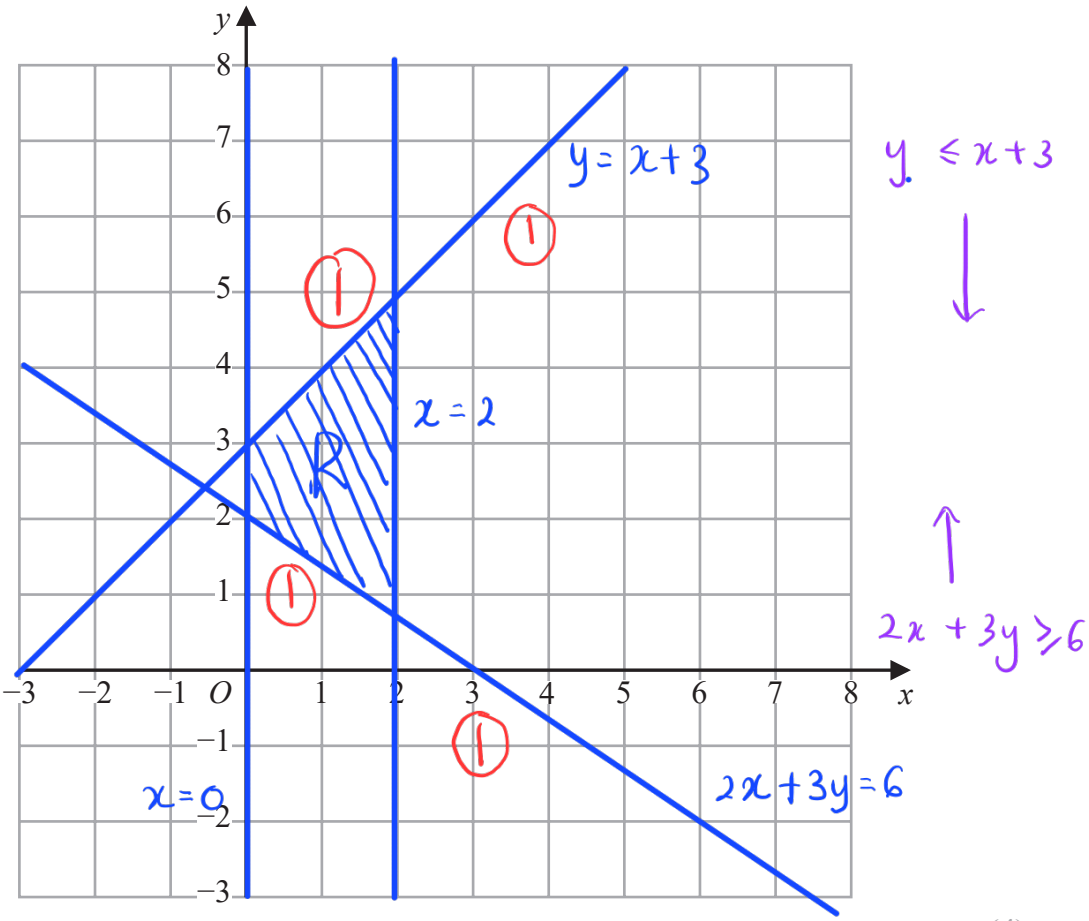
1 (a) On the grid show, by shading, the region that satisfies all these inequalities.

$x \geqslant 0$ $x \leqslant 2$ $y \leqslant x + 3$ $2x + 3y \geqslant 6$

Label the region **R**.



y ⩽ x + 3

2x + 3y ⩾ 6

x ⩾ 0 →

← x ⩽ 2

(4)

Tips : How to draw your lines

$y \geqslant mx + c$ →

$y \leqslant mx + c$



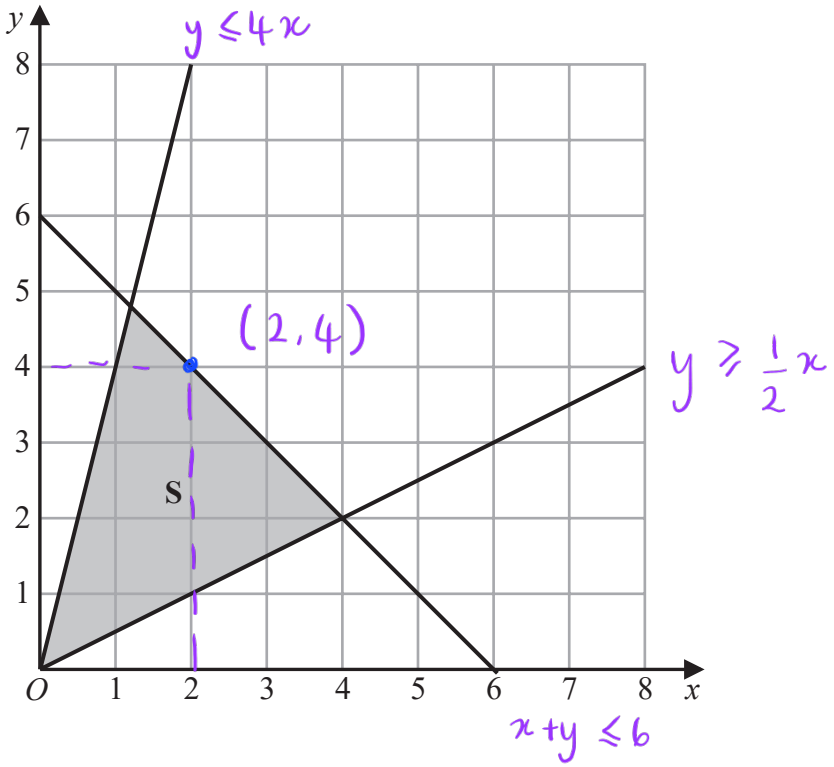
$y > mx + c$ →

$y < mx + c$



(b) The diagram below shows the region **S** that satisfies the inequalities

$$y \leqslant 4x \qquad y \geqslant \frac{1}{2}x \qquad x + y \leqslant 6$$



Geoffrey says that the point with coordinates (2, 4) does not satisfy all the inequalities because it does not lie in the shaded region.

Is Geoffrey correct?
You must give a reason for your answer.

No. Because point (2,4) satisfy the $x+y \leq 6$ inequalities. (1)

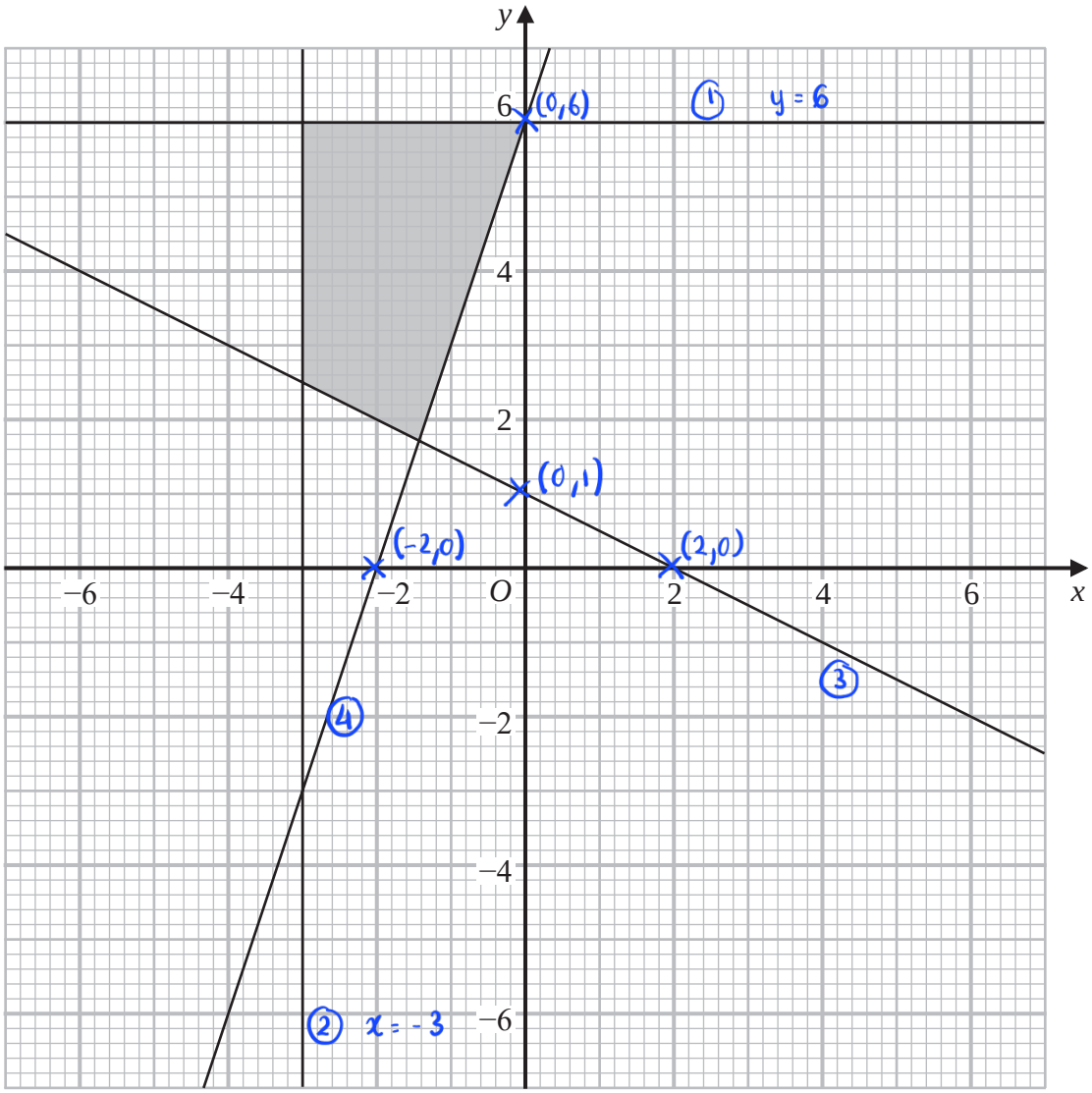
(1)

(Total for Question 1 is 5 marks)

The point is on the line with inequality symbol of $\leq$, so it is included in the shaded region.

If the point lies on a line with inequality symbol $<$ or $>$, it won't be included in the shaded region.

2 The shaded region shown on the grid is bounded by four straight lines.



Find the four inequalities that define the shaded region.

① $y \leqslant 6$

② $x \geqslant -3$

③ $m = \frac{0-1}{2-0} = -\frac{1}{2}$

$y = -\frac{1}{2}x + 1$

$y \geqslant -\frac{x}{2} + 1$

④ $m = \frac{6-0}{0-(-2)} = 3$

$y = 3x + 6$

$y \leqslant 3x + 6$

$y \leqslant 6$ (1)

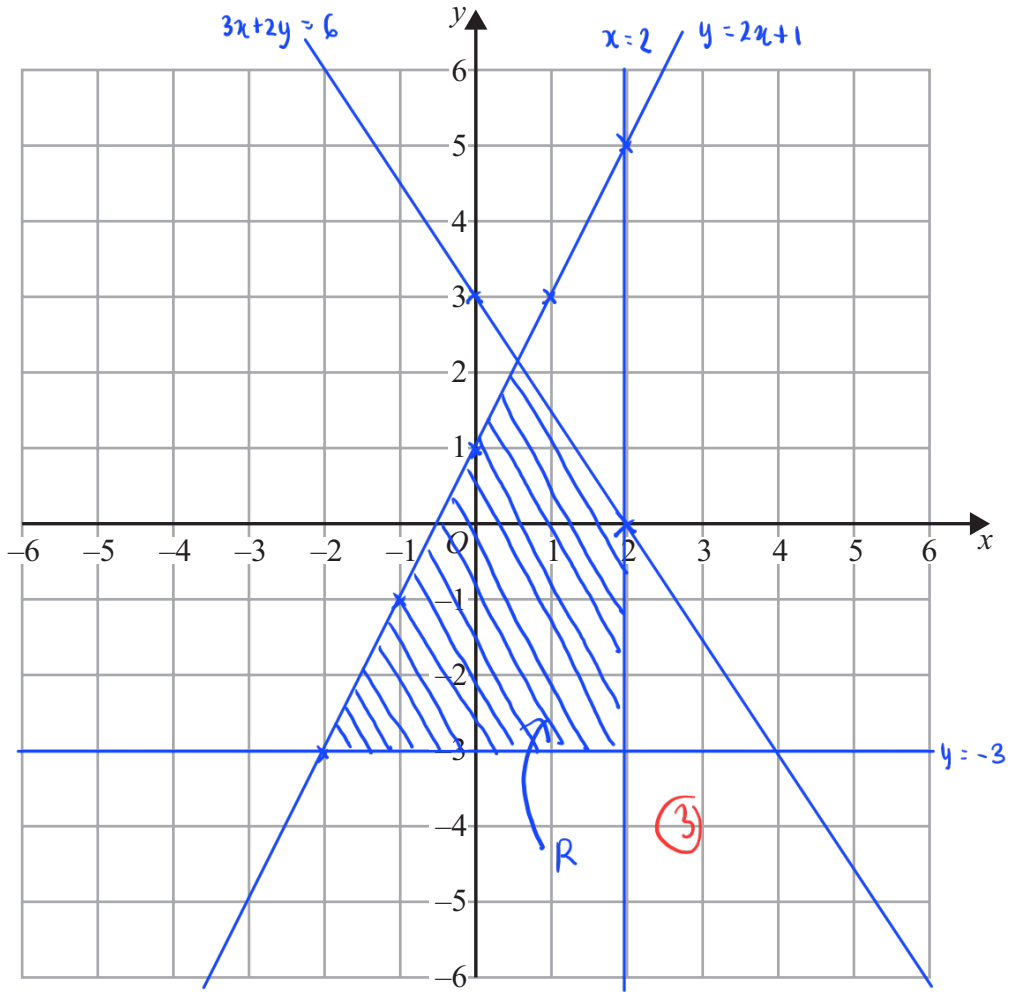
$x \geqslant 3$ (1)

$y \geqslant -\frac{x}{2} + 1$ (1)

$y \geqslant 3x + 6$ (1)

(Total for Question 2 is 4 marks)

3



On the grid, shade the region **R** that satisfies all the following inequalities.

$x \leqslant 2$ $y \geqslant -3$ $y \leqslant 2x + 1$ $3x + 2y \leqslant 6$

Label the region **R**.

(Total for Question 3 is 3 marks)