



Aberdare Community School  
Mathematics Department

WJEC GCSE

**Higher – Non Calculator**  
Algebra

# **Inequalities and regions**

Name: .....

Set: .....

Date: .....

Teacher: .....

17. On the graph paper below, draw the region which satisfies **all** of the following inequalities.

$$\begin{aligned} y &\leq \frac{x}{2} + 7 \\ x + y + 12 &\geq 0 \\ y &\leq 4 \\ x &\leq 2 \end{aligned}$$

**Make sure that you clearly indicate the region that represents your answer.**

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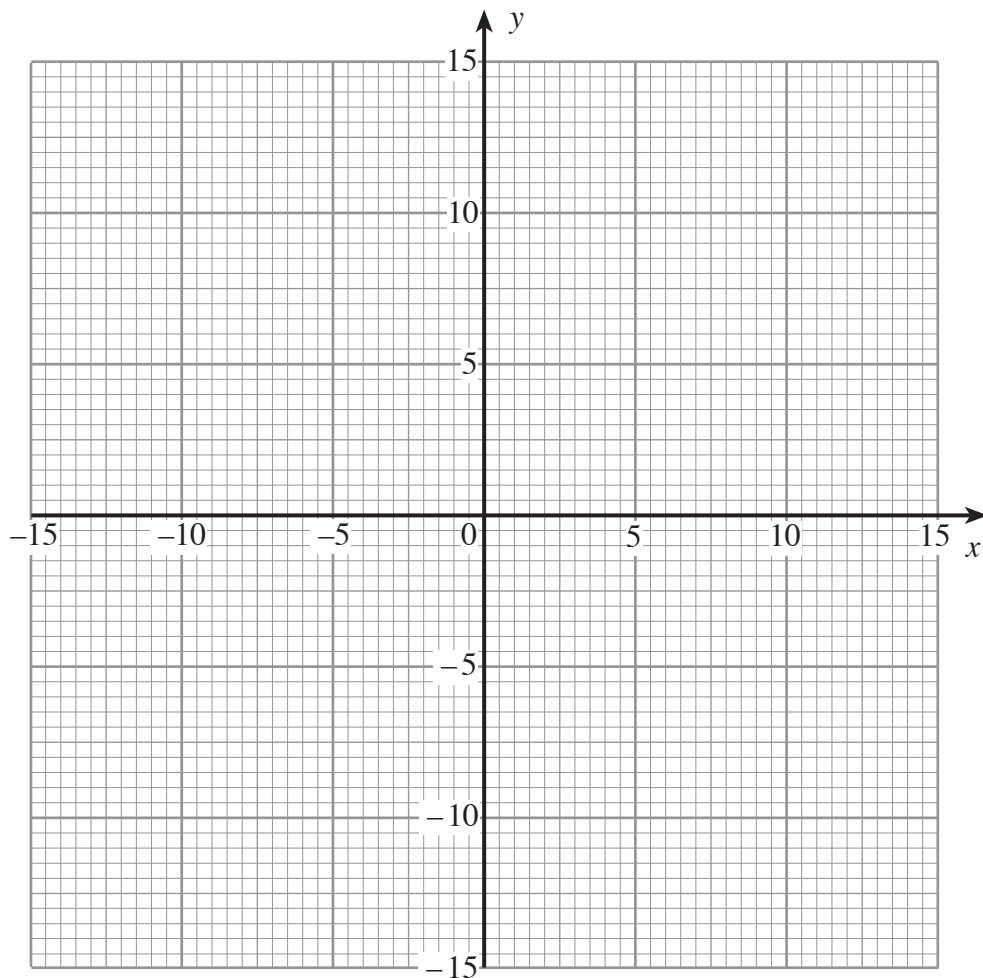
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[4]



13. On the graph paper below, draw the region which satisfies **all** of the following inequalities.

$$\begin{aligned}y &\leq 6 \\y &\geq x - 3 \\x &\leq 4 \\y &\geq -3x\end{aligned}$$

**Make sure that you clearly indicate the region that represents your answer.**

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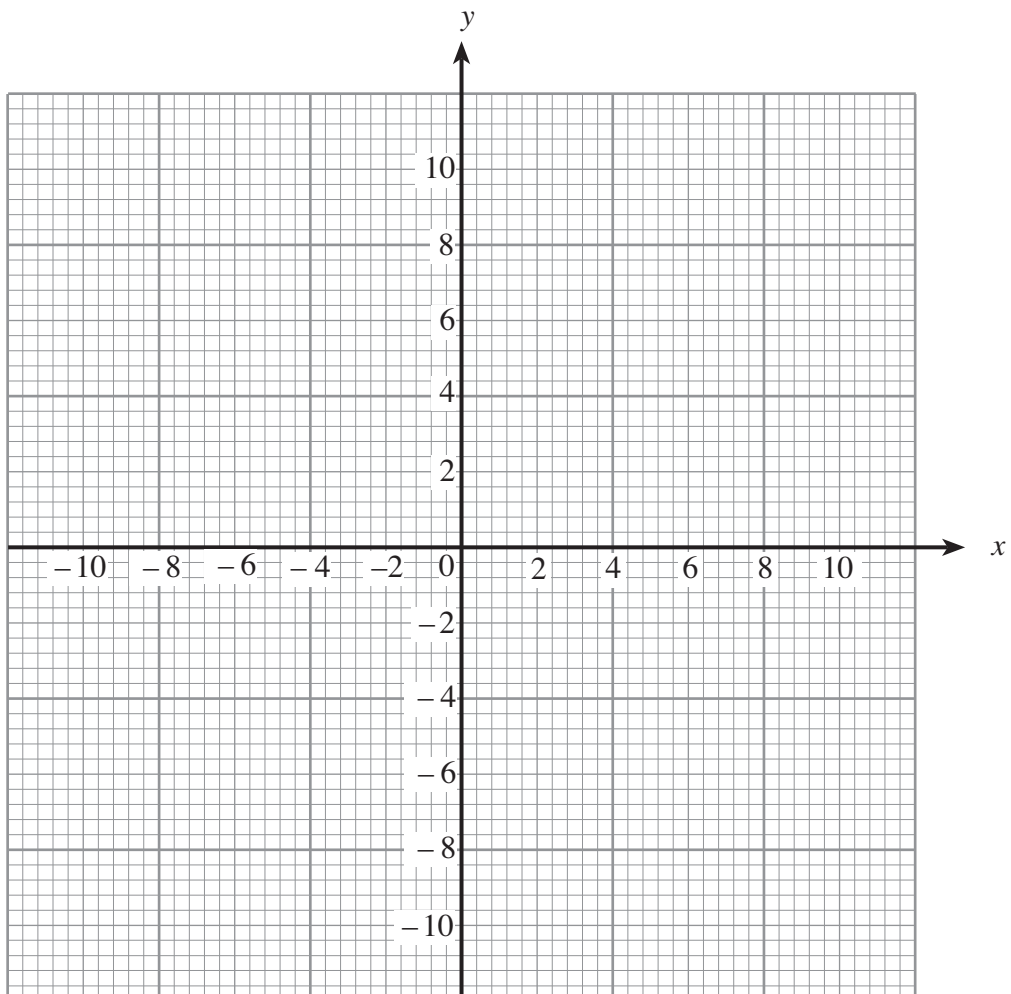
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[4]



13. On the graph paper provided, draw the region which satisfies **all** of the following inequalities.

$$\begin{aligned}x + y &\leq 10 \\ y - 6x + 4 &\leq 0 \\ y &\geq 2\end{aligned}$$

**Make sure that you clearly indicate the region that represents your answer.**

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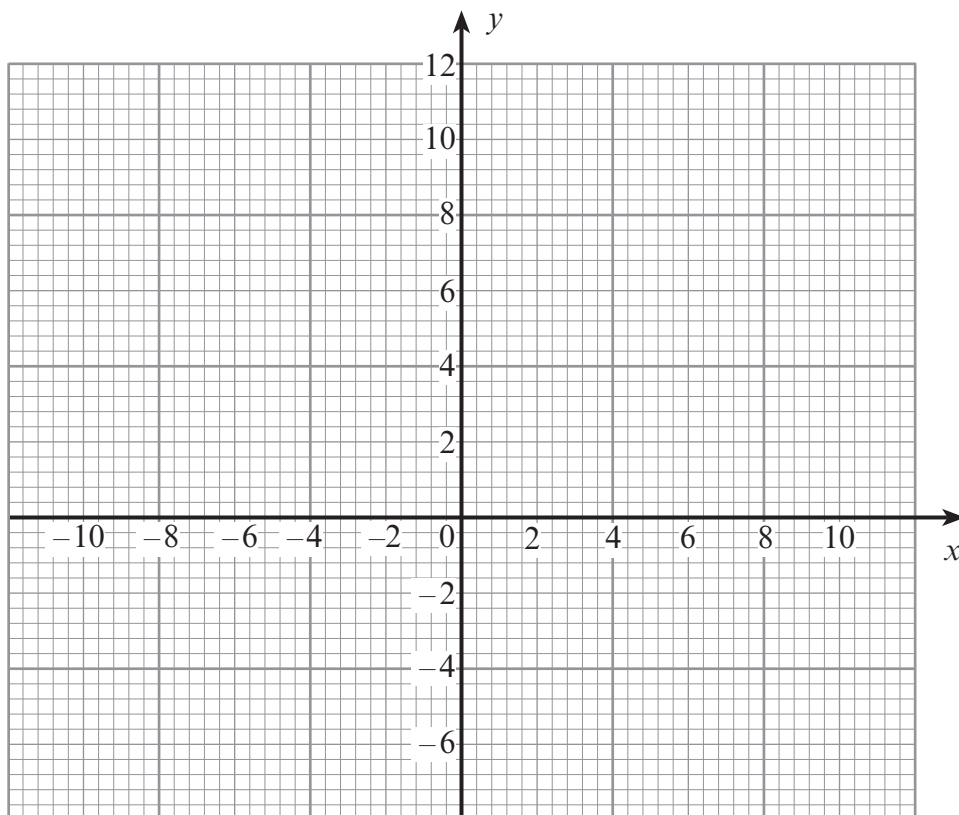
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[3]



14. On the graph paper below, draw the region which satisfies **all** of the following inequalities.

$$y \leq \frac{x}{2} + 4$$

$$x + y + 6 \geq 0$$

$$y \leq 4$$

$$x \leq 3$$

**Make sure that you clearly indicate the region that represents your answer.**

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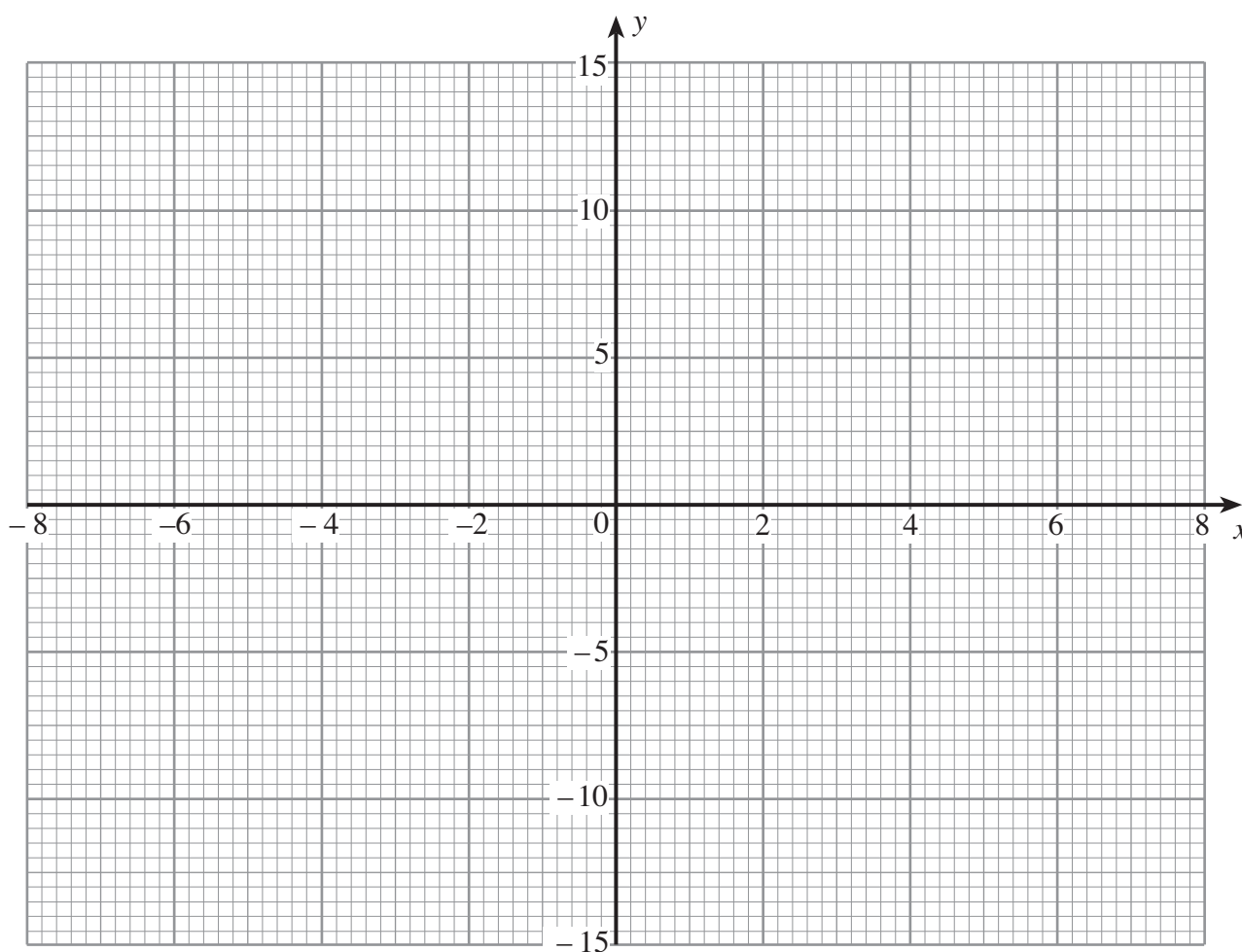
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[4]



- (b) On the graph paper below, draw the region which satisfies **all** of the following inequalities.

$$x \geq 1$$

$$y \geq 2$$

$$x + 3y \leq 18$$

**Make sure that you clearly indicate the region that represents your answer.**

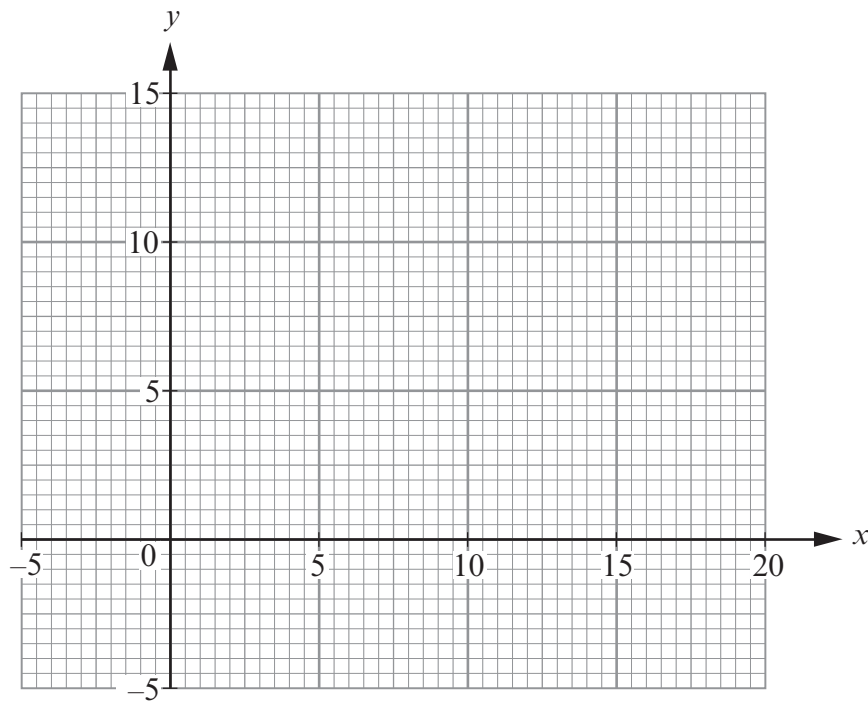
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[3]



9. On the graph paper below, draw the region which satisfies **all** of the following inequalities.

$$\begin{aligned} y &\leq 5 \\ x + y &\leq 4 \\ x &\leq 3 \\ x + y &\geq 0 \end{aligned}$$

**Make sure that you clearly indicate the region that represents your answer.**

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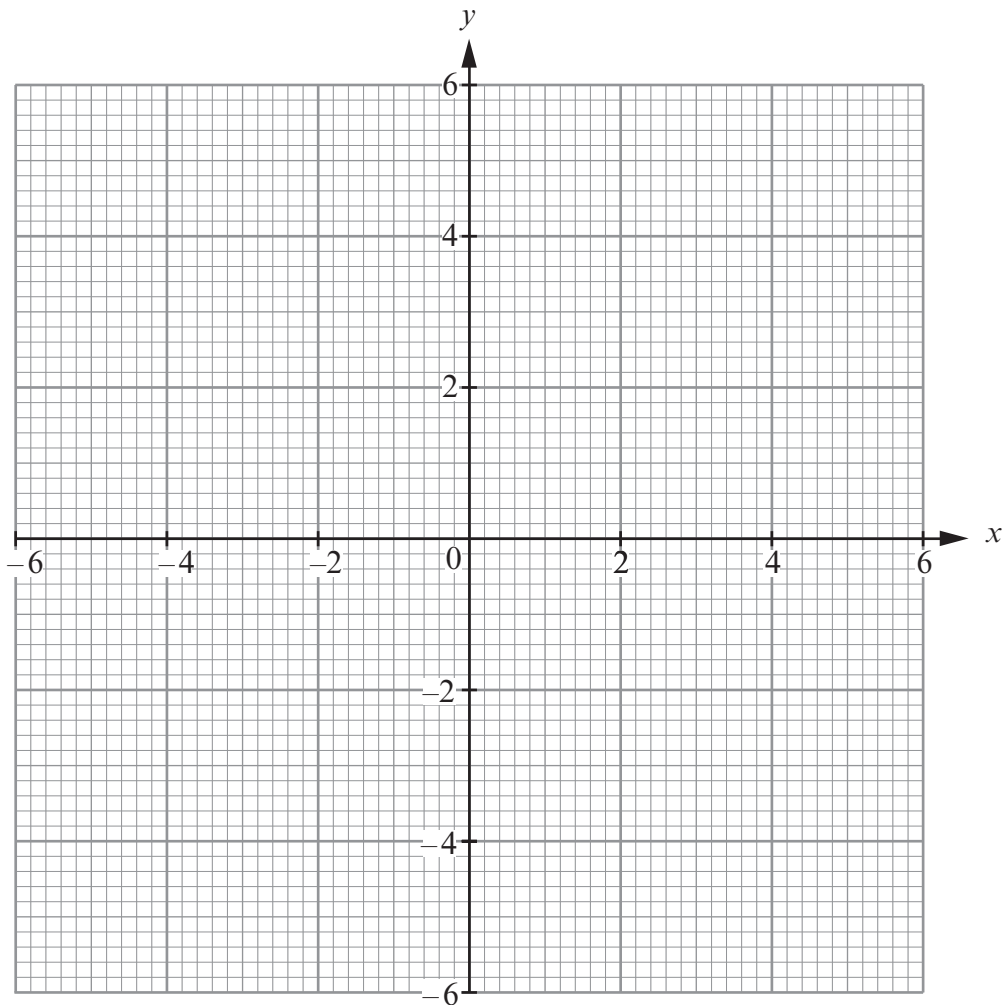
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[4]



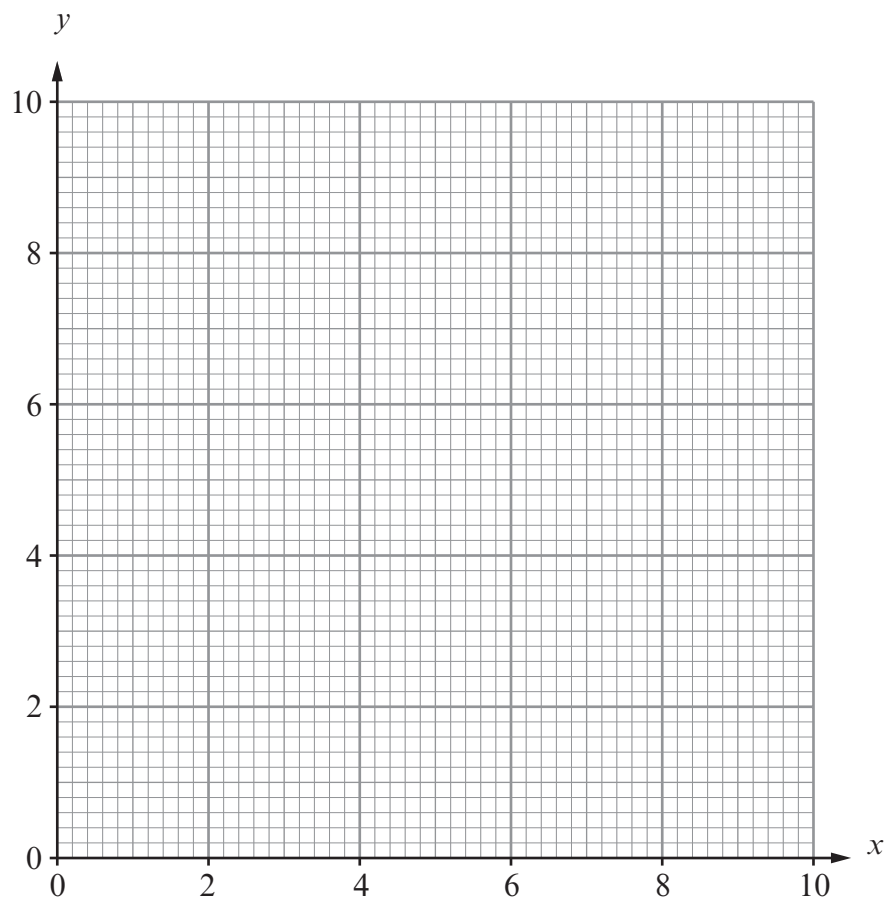
10. A cutting machine has two settings,  $x$  and  $y$ .  
For safety in operating the cutting machine, the settings  $x$  and  $y$  must be selected so that all the inequalities below are satisfied.

$$x + y < 8$$

$$5x + y > 10$$

$$2y - x > 4$$

- (a) Use the graph paper below to identify the region that shows the safe settings of  $x$  and  $y$  for the cutting machine.



[3]

- (b) Write down a set of possible safe settings for the cutting machine.

$x = \dots\dots\dots$  and  $y = \dots\dots\dots$

[1]





6. (a) Rafi has been asked to paint a region on a coordinate grid.  
He is given the following criteria.  
The region must be such that

- $y \leq x$
- $x \leq 1$
- $y \geq -2$

Use the grid below to show the region that Rafi needs to paint.

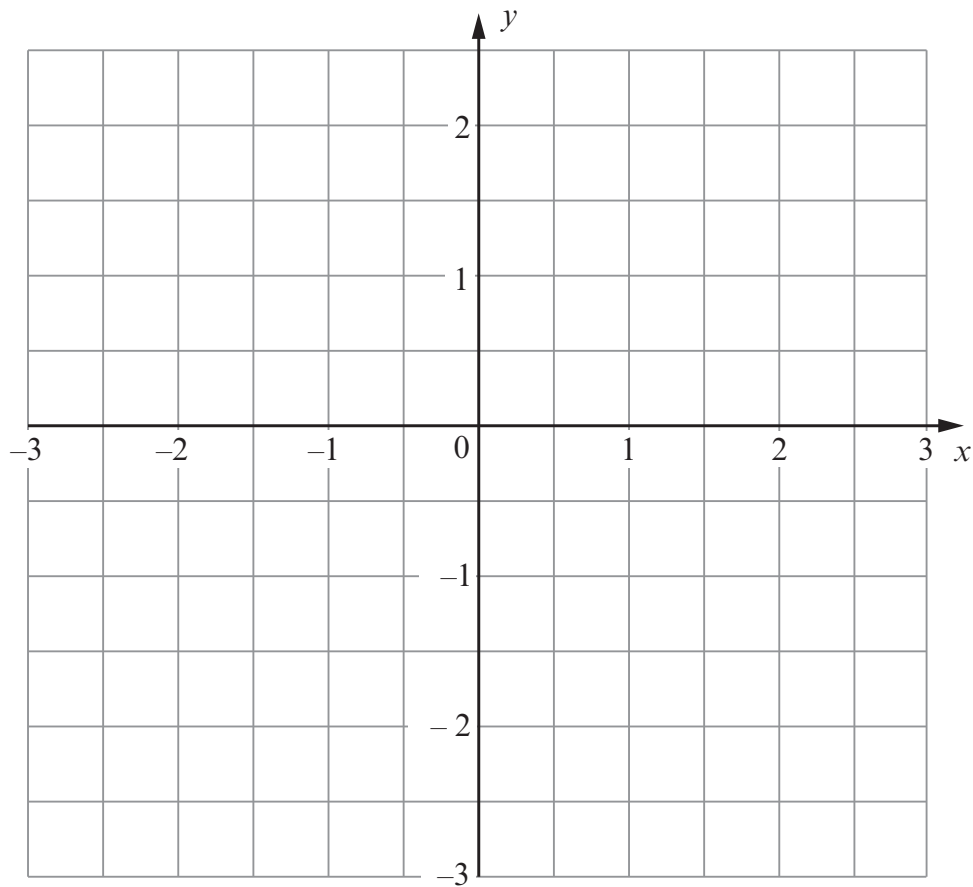
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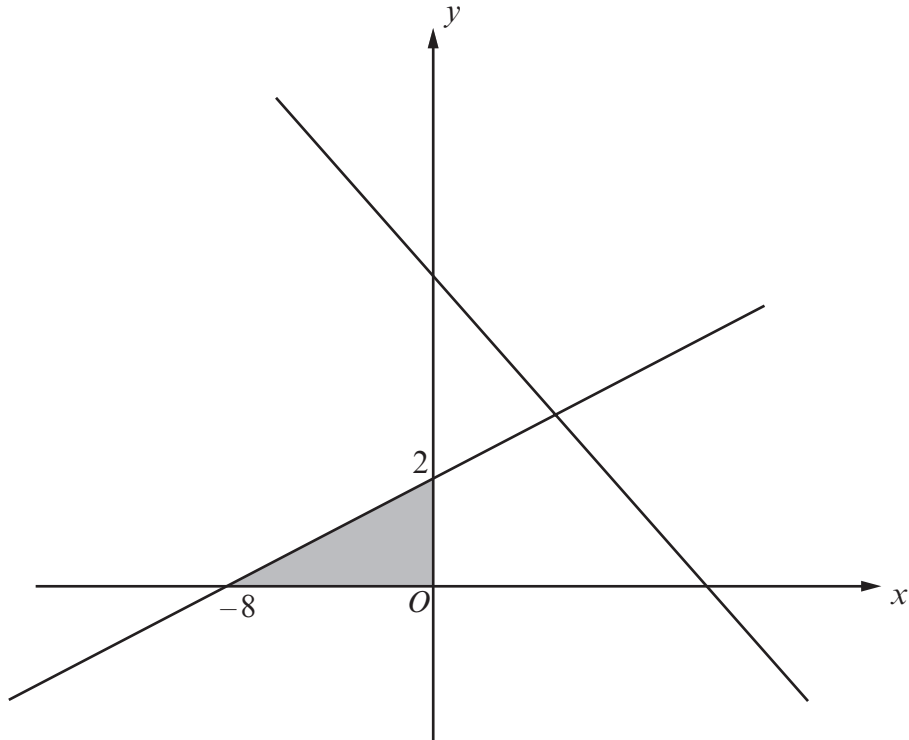
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[3]



5. (a) Mel is designing a new logo for her company. She starts with an  $x$ -axis and a  $y$ -axis. She sketches two straight lines and shades a region. This shape will become a part of the company logo.



*Diagram not drawn to scale*

Find the three inequalities that define the shaded region.

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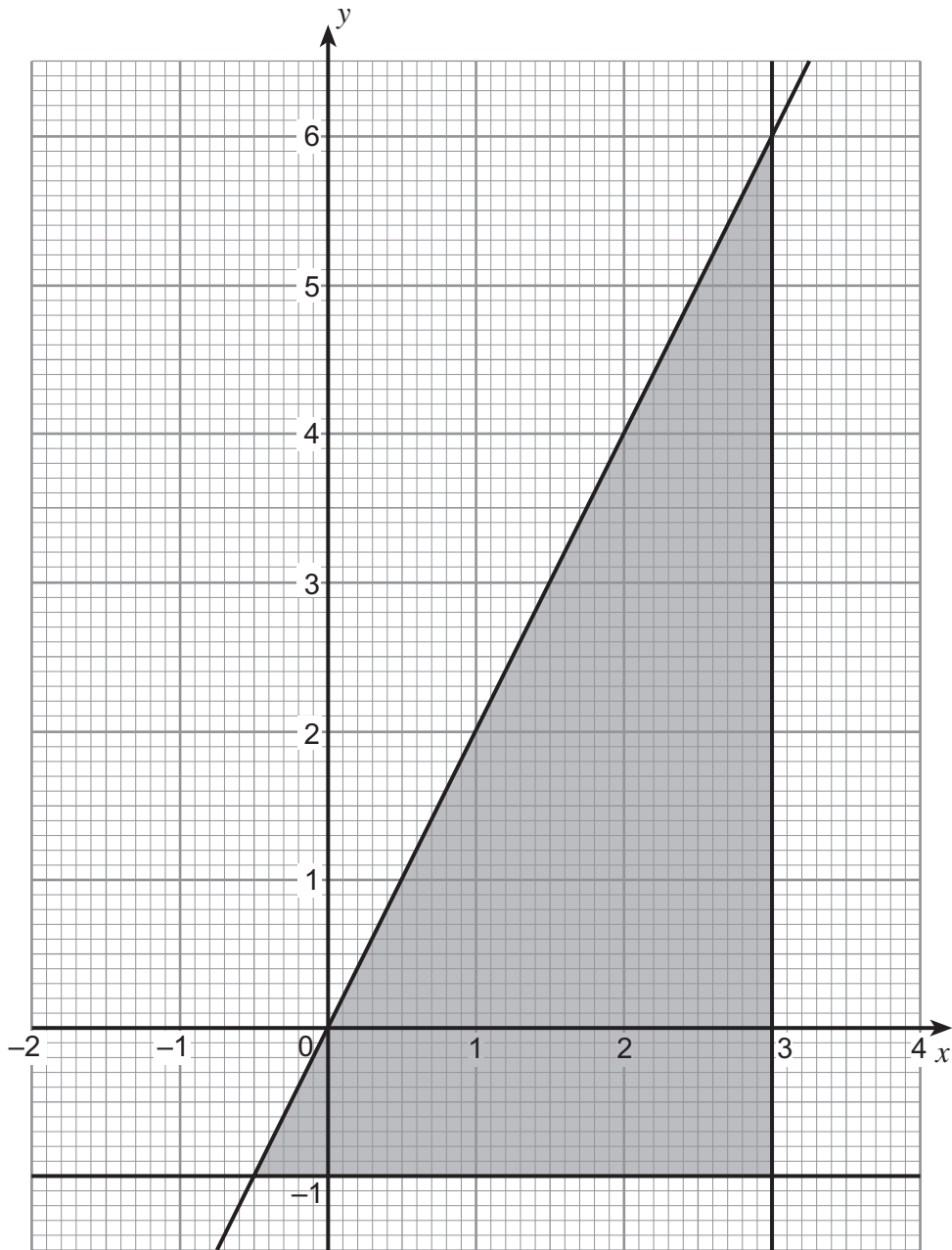
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[6]



7.



Complete the following table to give the set of inequalities that describes the shaded region drawn above. [3]

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$x \leq 3$

11. Using the axes below, find the region defined by the following inequalities. [4]

$$\begin{aligned}x &\geq -2 \\y &\geq 1 \\x + 2y &\leq 4\end{aligned}$$

**Make sure that you clearly indicate the region that represents your answer.**

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