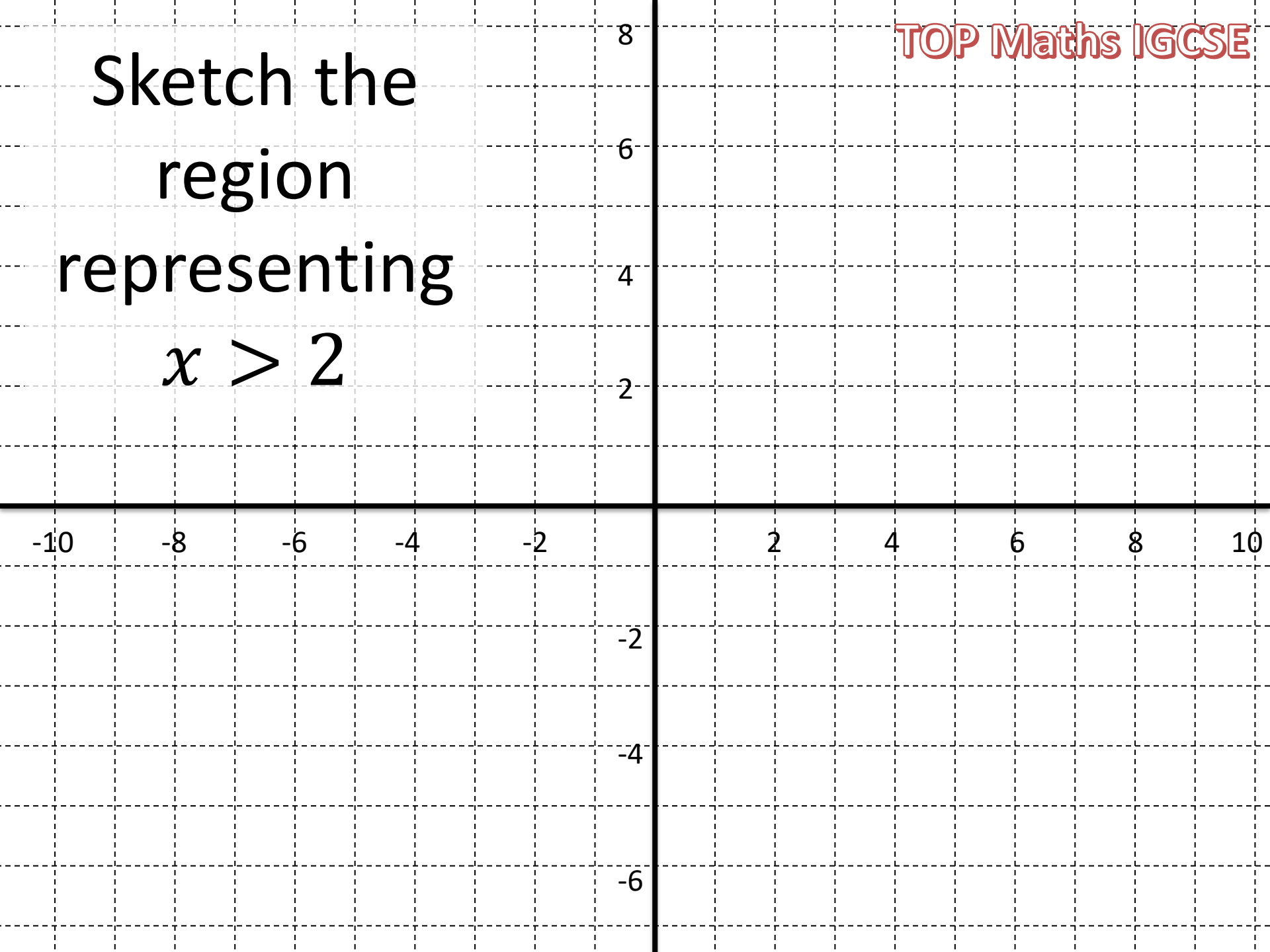
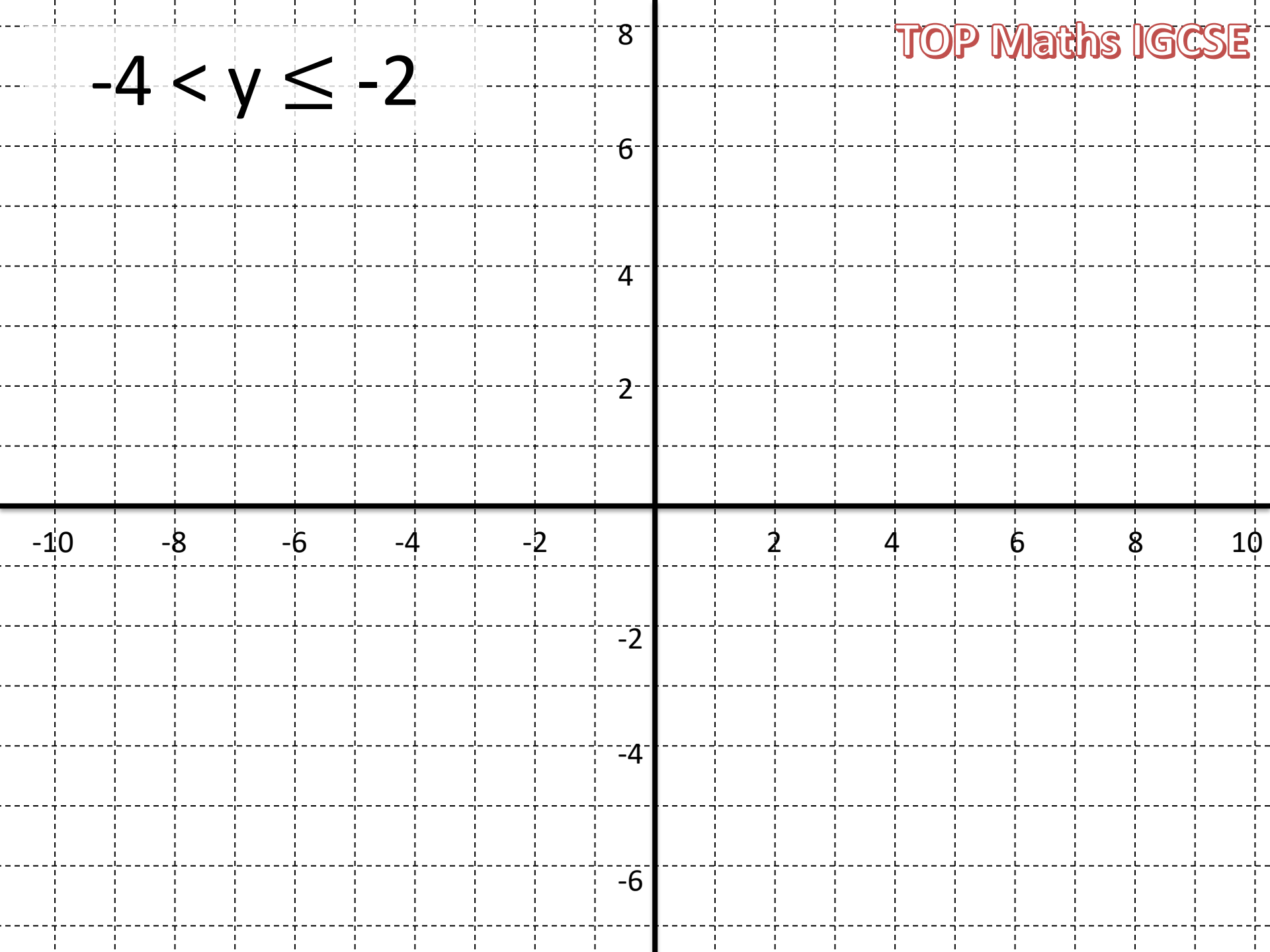
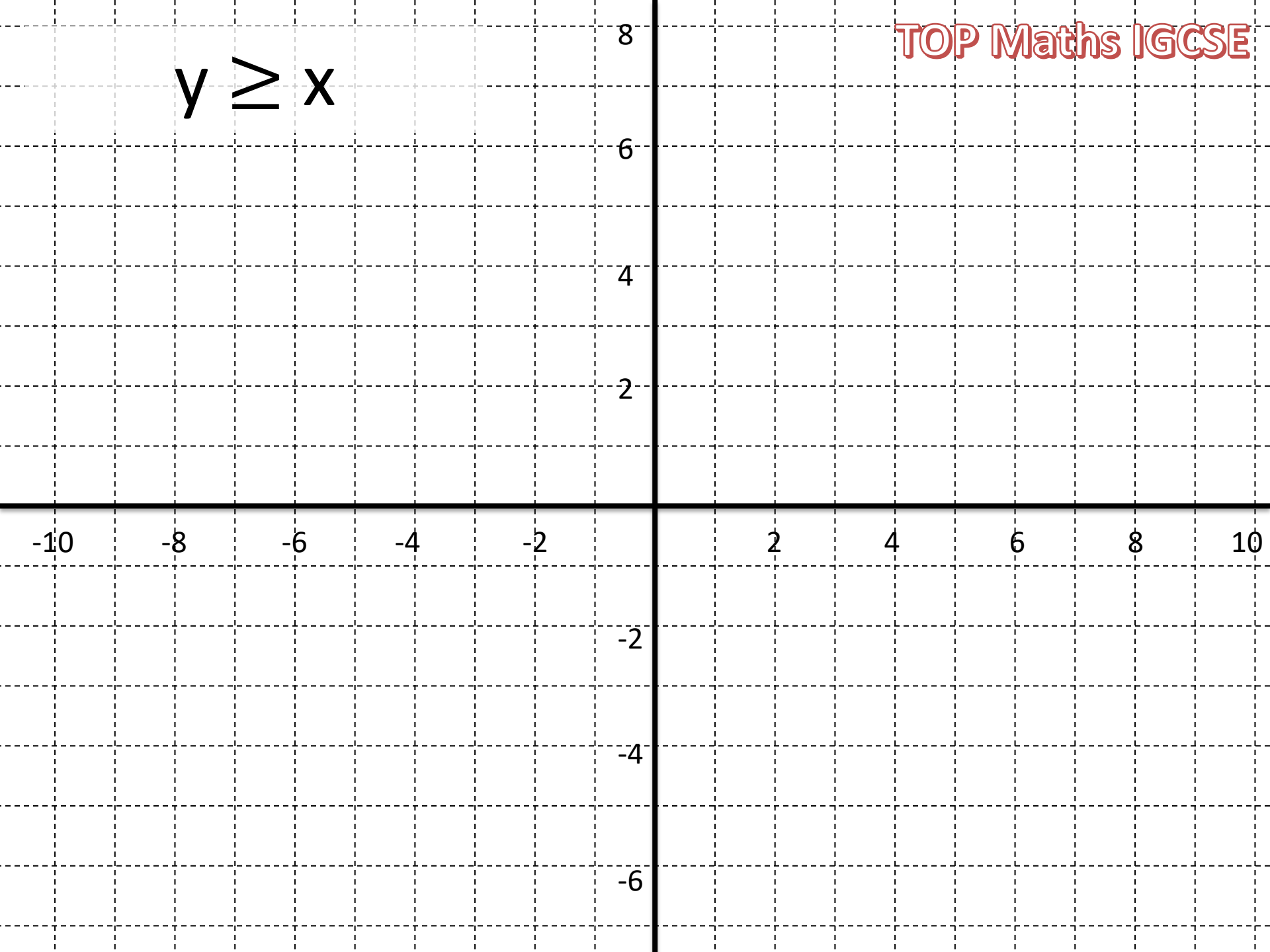
Inequalities – Shading Regions

Sketch the region representing $x > 2$



$-4 < y \leq -2$




$y \geq x$
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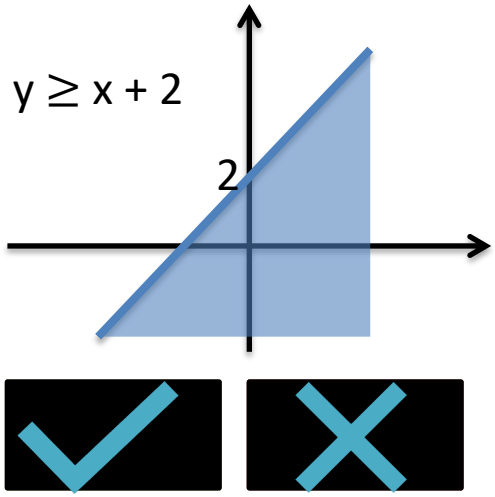
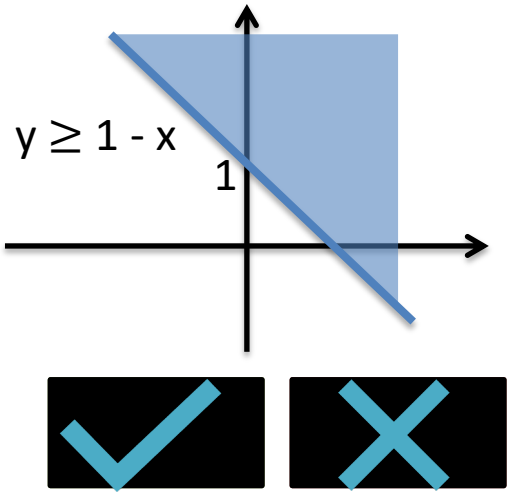
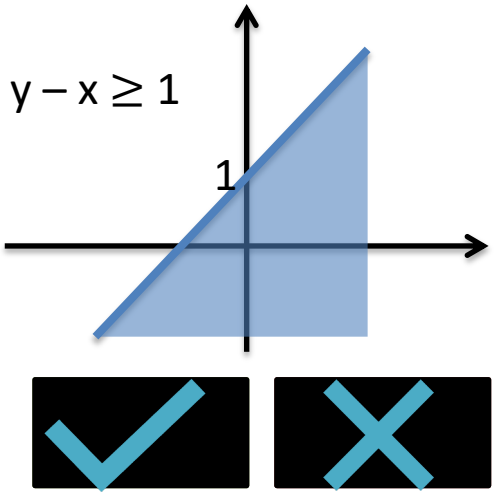
8
6
4
2
-10
-8
-6
-4
-2
2
4
6
8
10
-2
-4
-6

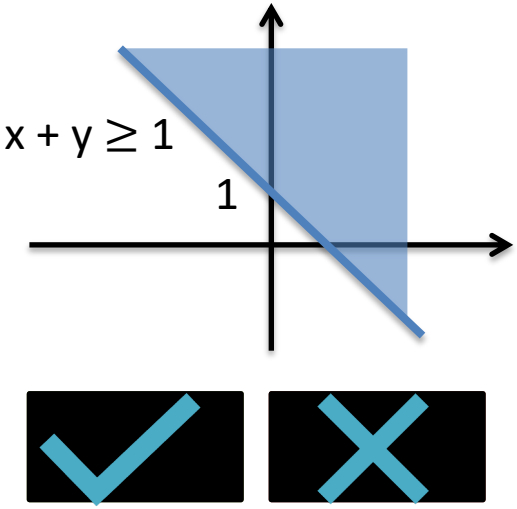
Regions

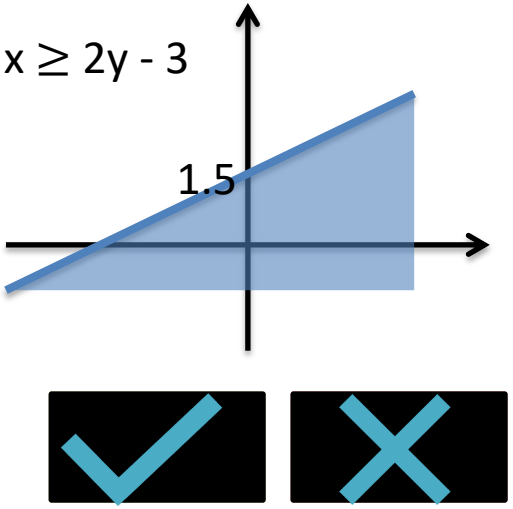
Is the region on the correct side of the line?

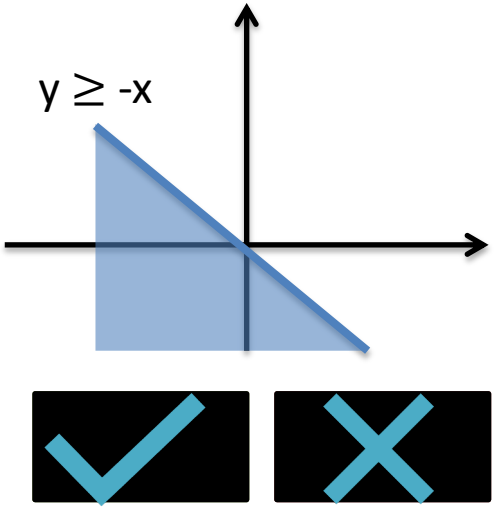












Combining Inequalities

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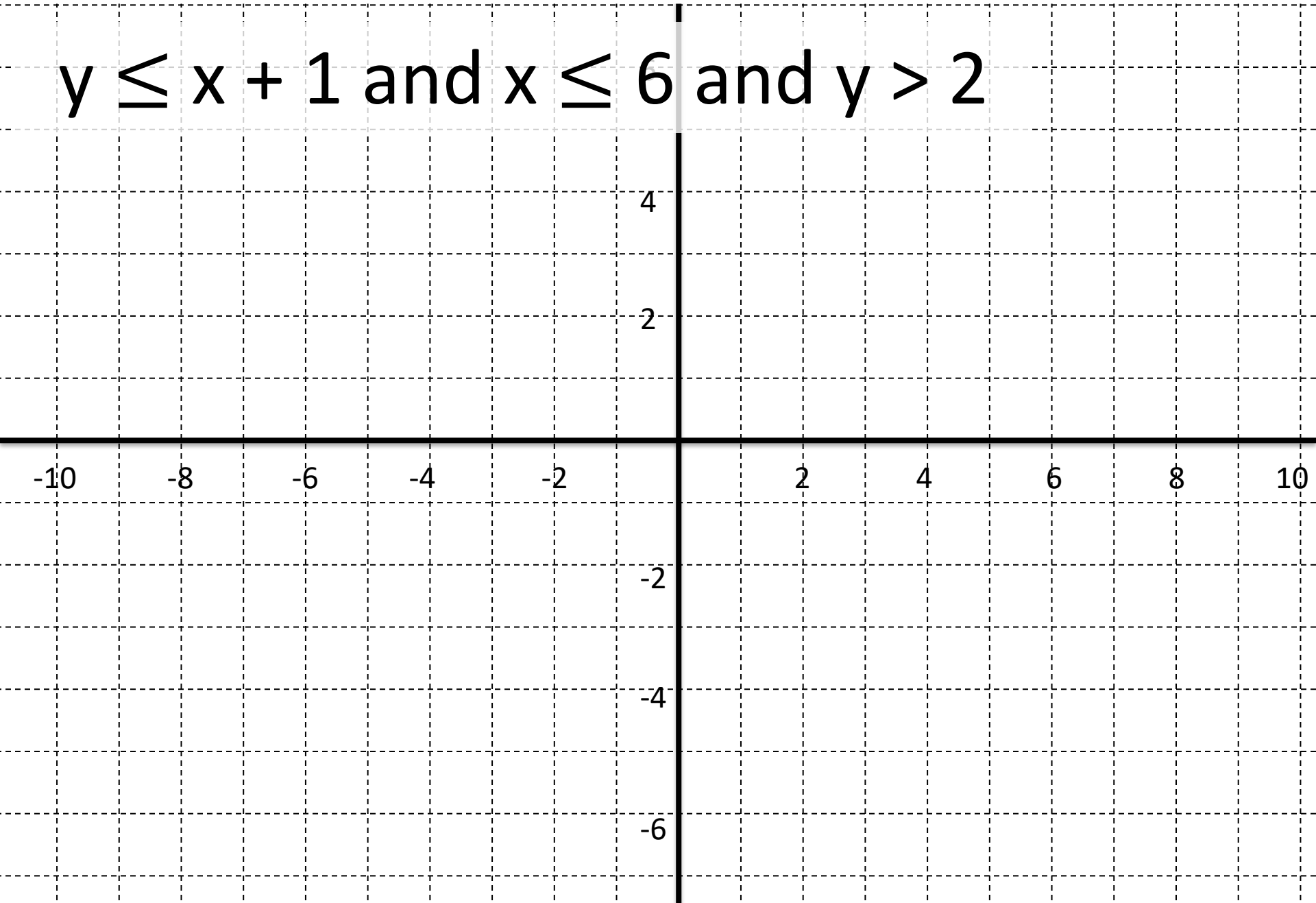
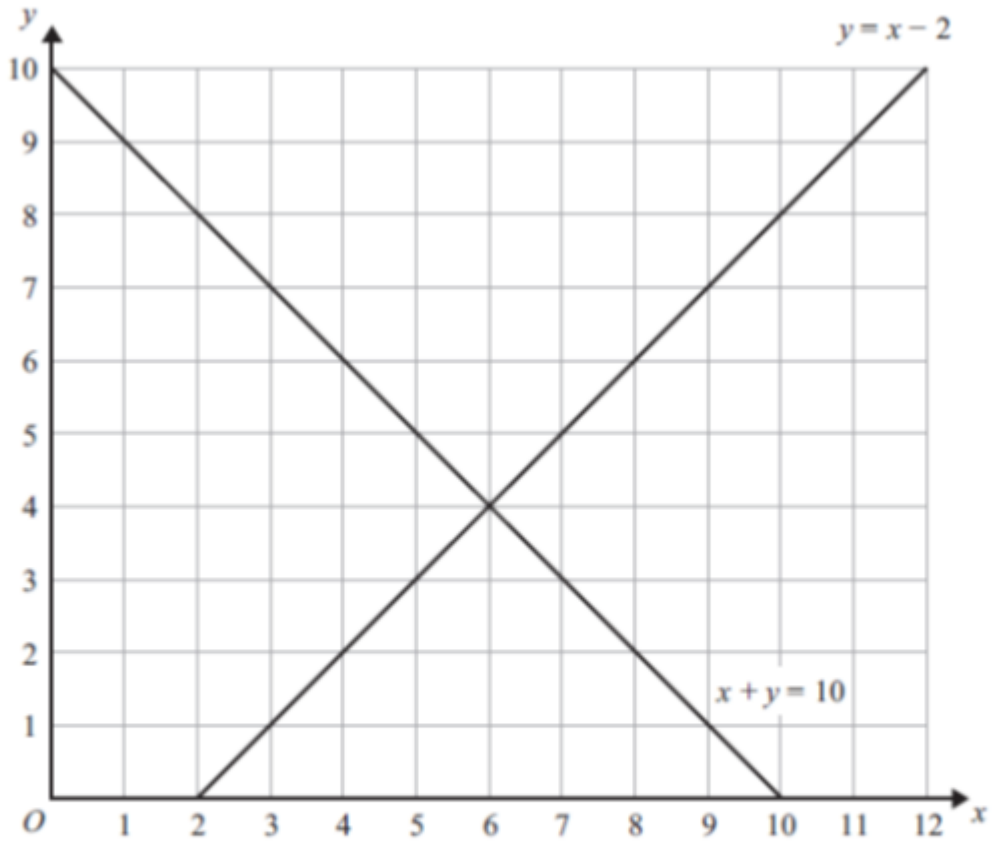
$y \leq x + 1$ and $x \leq 6$ and $y > 2$



Question 1

The lines $y = x - 2$ and $x + y = 10$ are drawn on the grid.



On the grid, mark with a cross (×) each of the points with integer coordinates that are in the region defined by

$$y > x - 2$$
$$x + y < 10$$
$$x > 3$$

Question 2

$4x + 3y < 12$

x and y are both integers.

Write down two possible pairs of values that satisfy this inequality.

$x =$ ....., $y =$ .....

and $x =$ ....., $y =$ .....

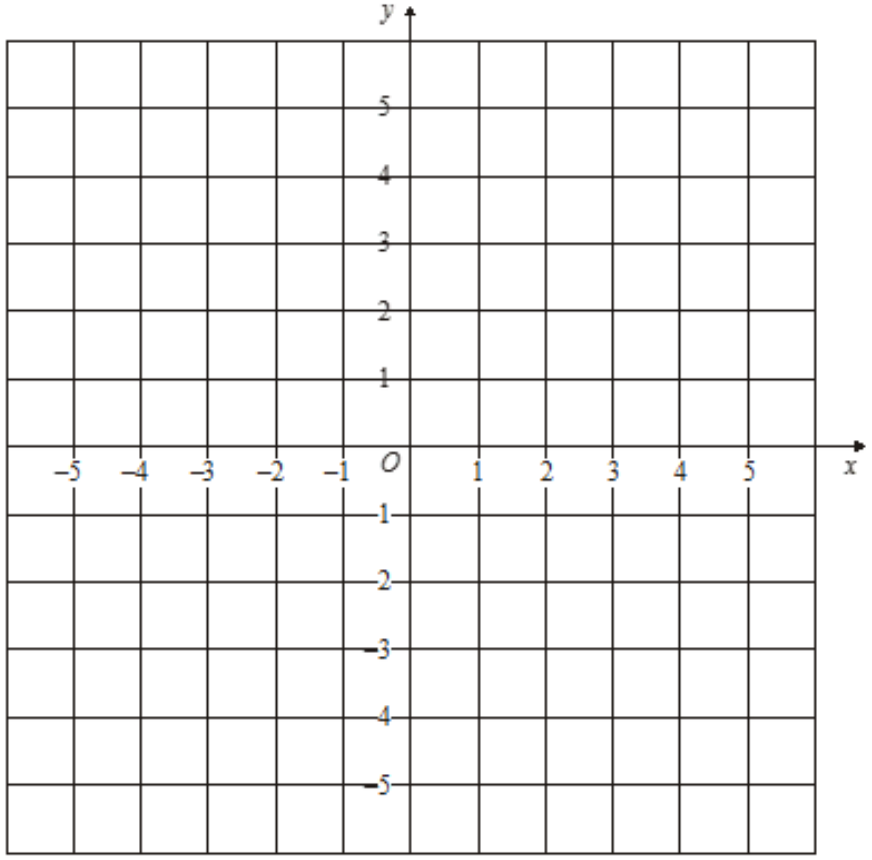
(2)

(b) $4x + 3y < 12$, $y < 3x$, $y > 0$, $x > 0$

x and y are both integers.

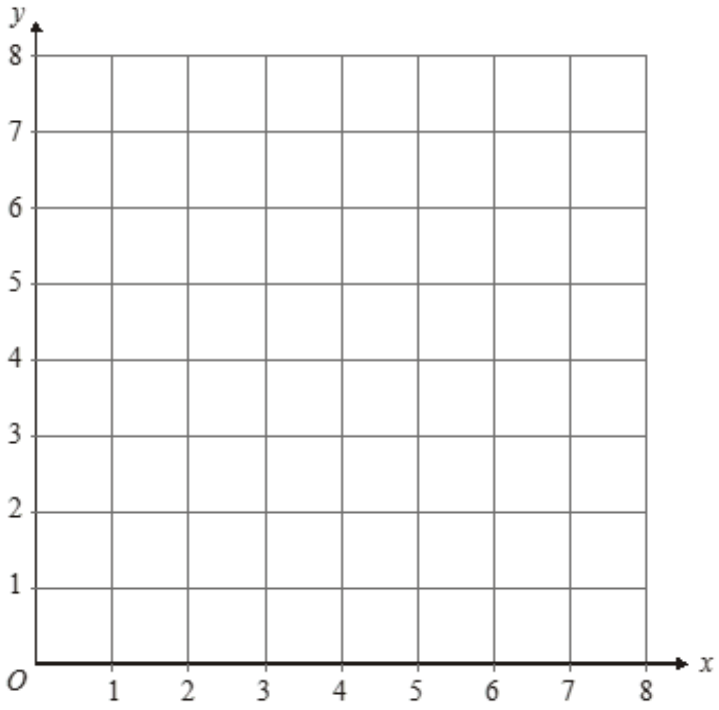
On the grid, mark with a cross (×), each of the **three** points which satisfy **all** these four inequalities.

(3)
(Total 5 marks)



Question 3

(a) On the grid below, draw straight lines and use shading to show the region **R** that satisfies the inequalities $x \geq 2$ $y \geq x$ $x + y \leq 6$



(3)

The point P with coordinates (x, y) lies inside the region **R**.
x and y are **integers**.

(b) Write down the coordinates of **all** the points of **R** whose coordinates are both integers.

.....

(2)

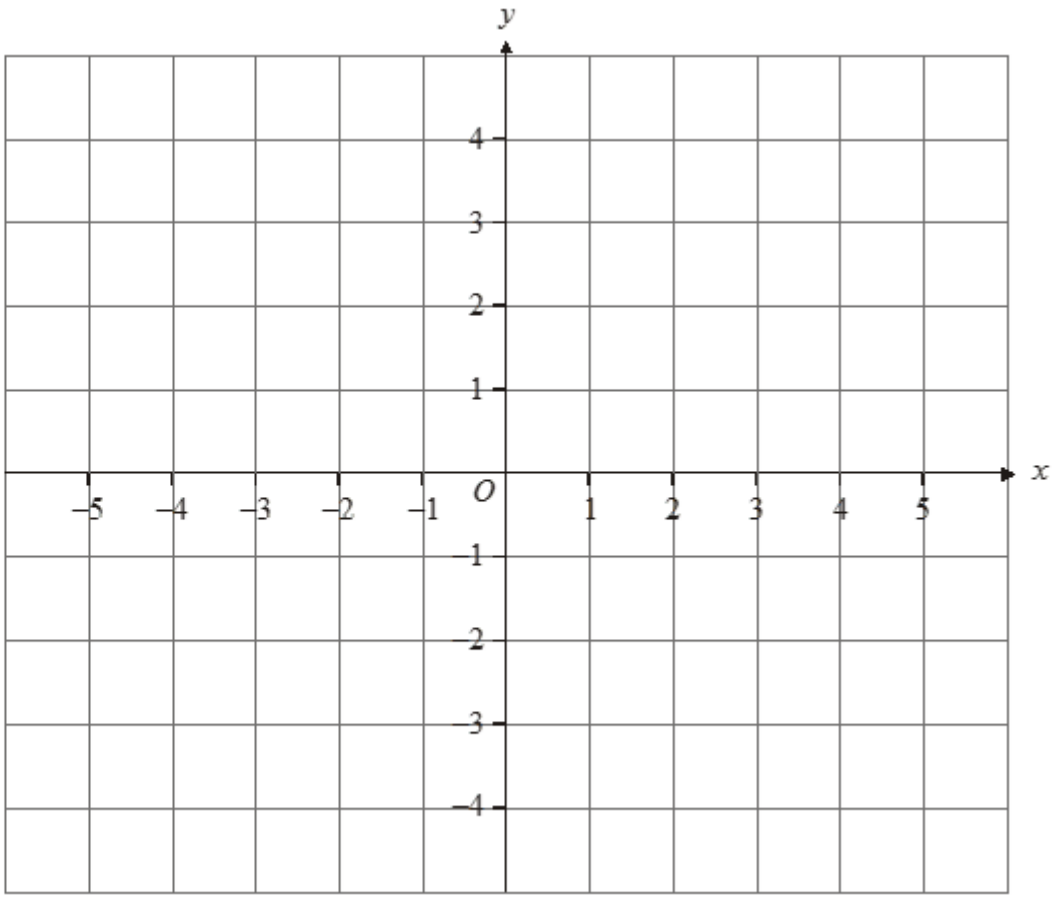
Question 4

$-2 < x \leq 1$ $\quad y > -2$ $\quad y < x + 1$

x and y are integers.

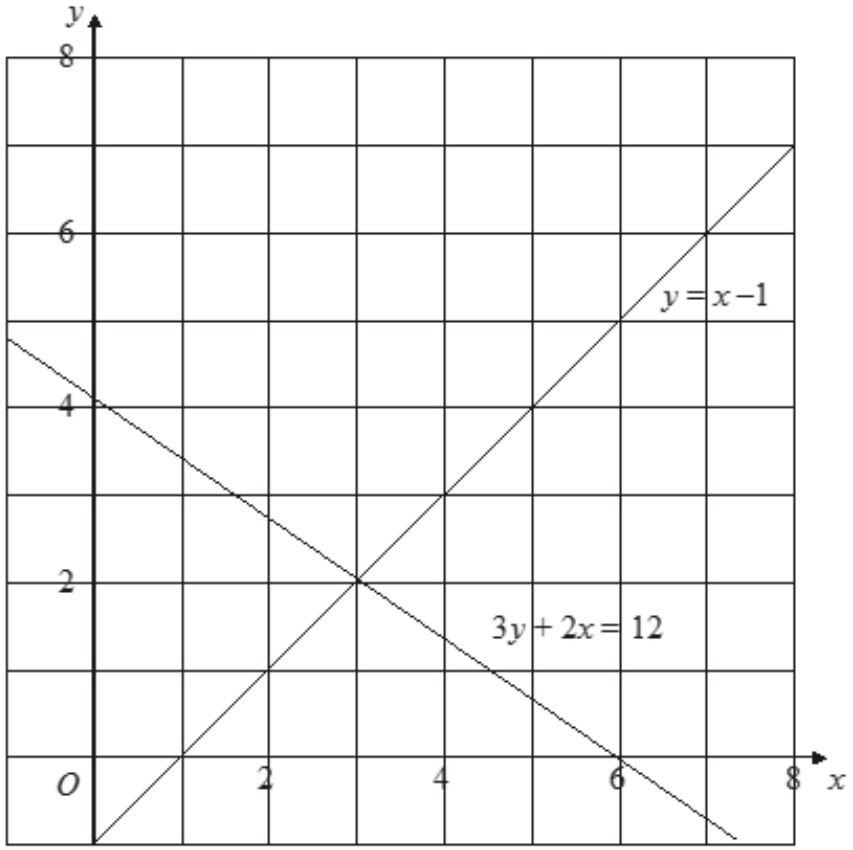
On the grid, mark with a cross (✖), each of the six points which satisfies **all** these 3 inequalities.

(Total 3 marks)



Question 5

The graphs of the straight lines with equations $3y + 2x = 12$ and $y = x - 1$ have been drawn on the grid.



(a) Use the graphs to solve the simultaneous equations

$3y + 2x = 12$
$y = x - 1$

$x =$ ..... $y =$ ....

(1)

(b) $3y + 2x > 12$ $y < x - 1$ $x < 6$

x and y are integers. On the grid, mark with a cross (×) each of the **four** points which satisfies **all** these 3 inequalities.

(3)

Question 6

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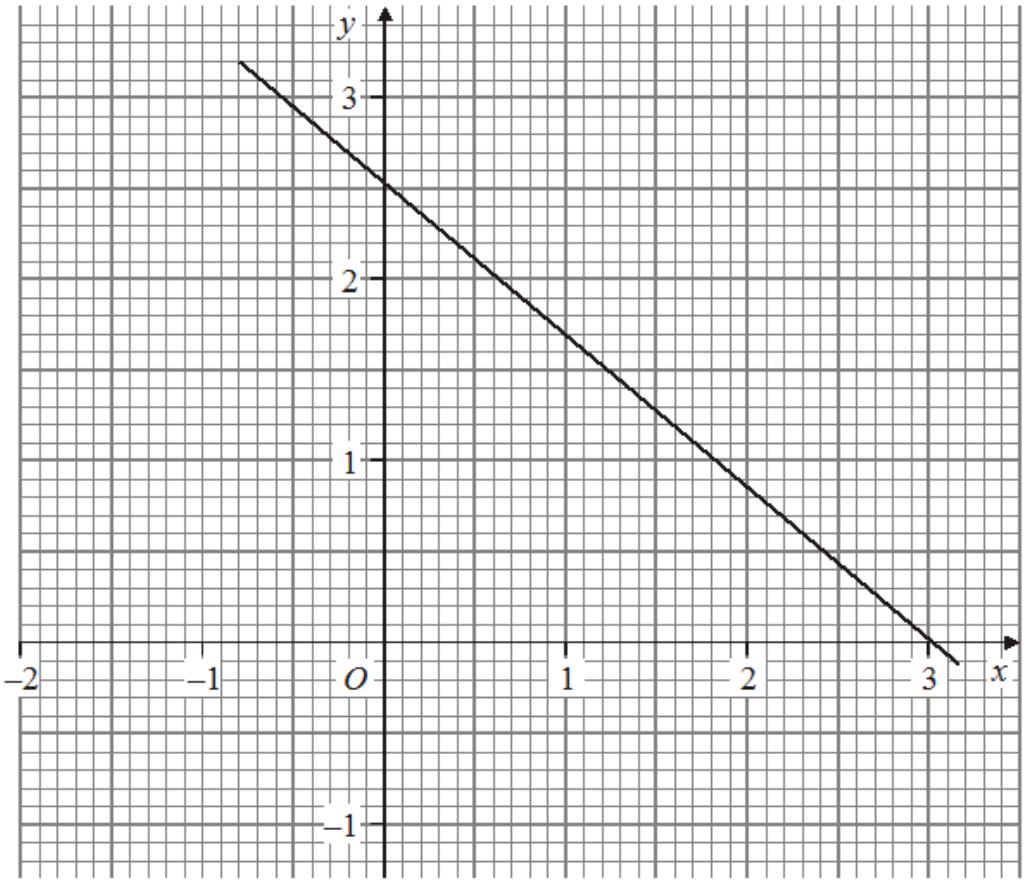
The line with equation $6y + 5x = 15$ is drawn on the grid above.



(a) Rearrange the equation $6y + 5x = 15$ to make y the subject.

$y =$ .....

(2)

(b) The point $(-21, k)$ lies on the line.
Find the value of k.

$k =$ .....

(2)

(c) (i) On the grid, shade the region of points whose coordinates satisfy the four inequalities

$y > 0, \quad x > 0, \quad 2x < 3, \quad 6y + 5x < 15$

Label this region ***R***.

P is a point in the region ***R***. The coordinates of P are both integers.

(ii) Write down the coordinates of P.

(..... , ...)

(3)