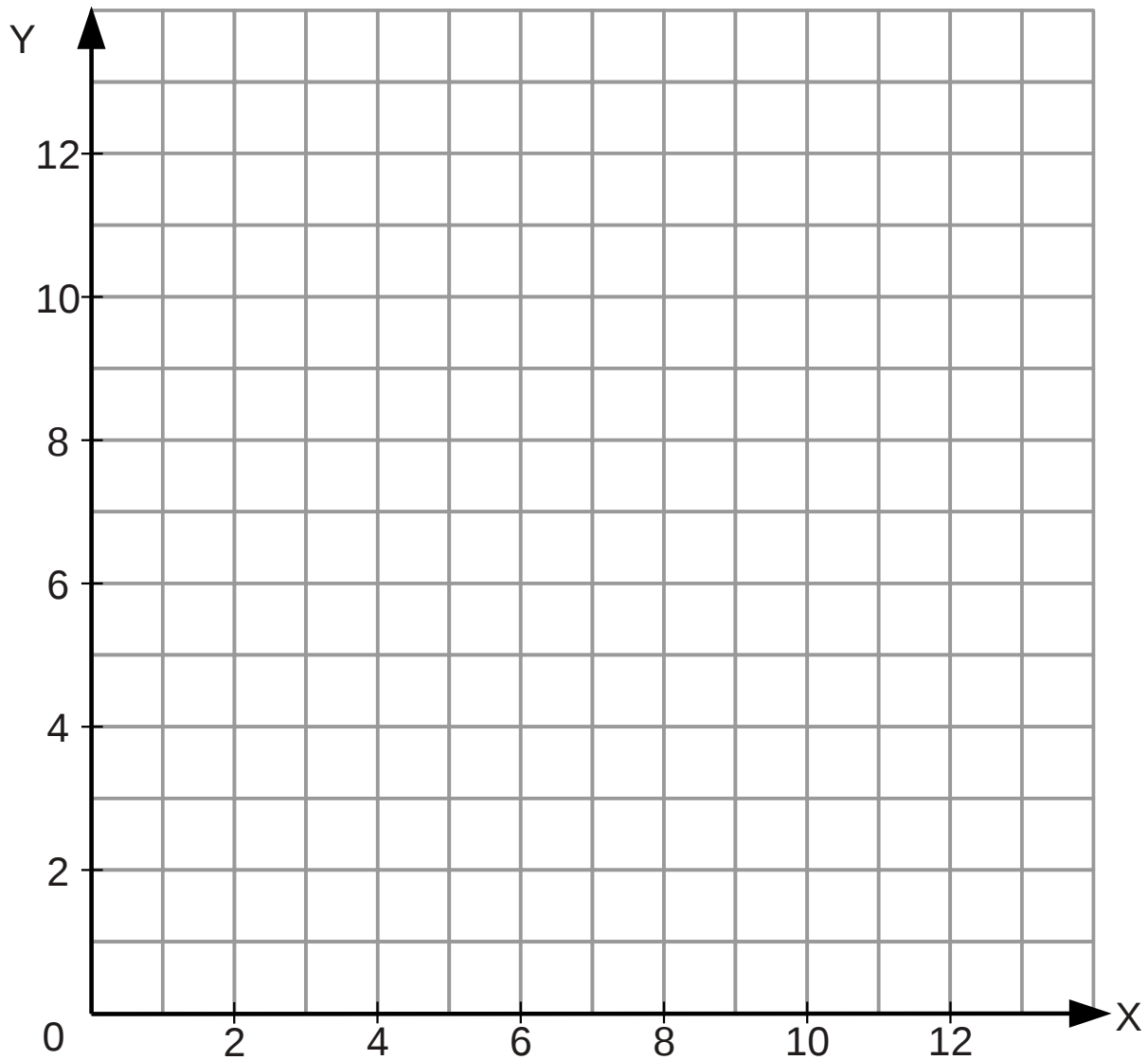


Worksheet 16: Coordinates and graphs

Grids have been provided on this sheet using a drawing package to generate the lines. On the exam they use proper graph grids with a much higher quality of reproduction. You will need a ruler and a pencil.

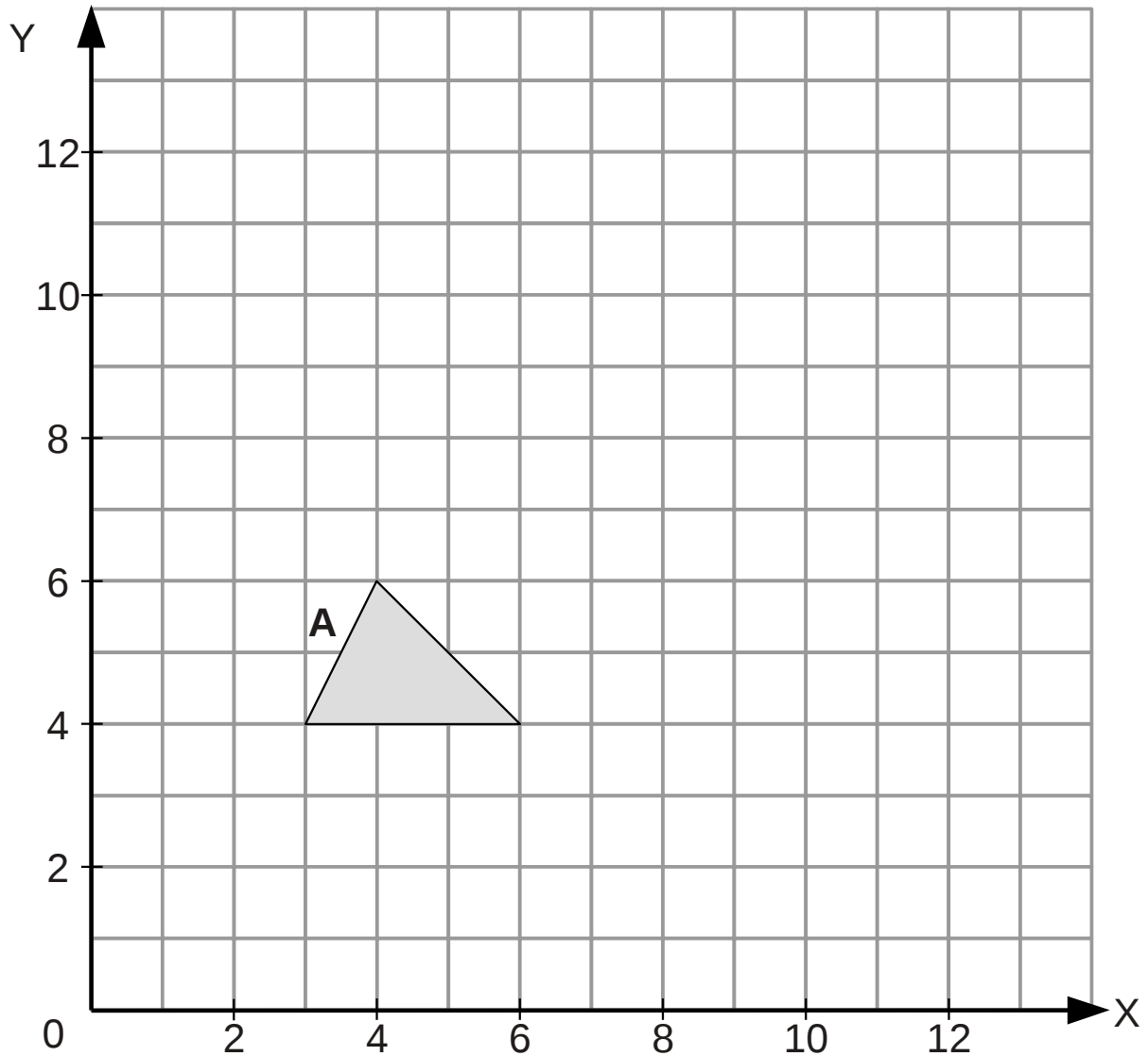
Plotting coordinates



Plot the point $(11, 10)$ and label the point A. Plot point B at $(3, 5)$
Draw the line AB and mark the midpoint M of the line with a cross.
Write down the coordinates of M.
Add a point C to your plot so that ABC form an isosceles triangle.

Plotting special lines

The axes below show a triangle A.



Plot the line $x = 7$ on the axes

Reflect triangle A in the line $x = 7$ and label the image triangle B

Plot the line $y = 8$ on the axes

Reflect triangle B in the line $y = 8$ and label the image triangle C

Challenge: can you describe the transformation that takes triangle A directly to triangle B?

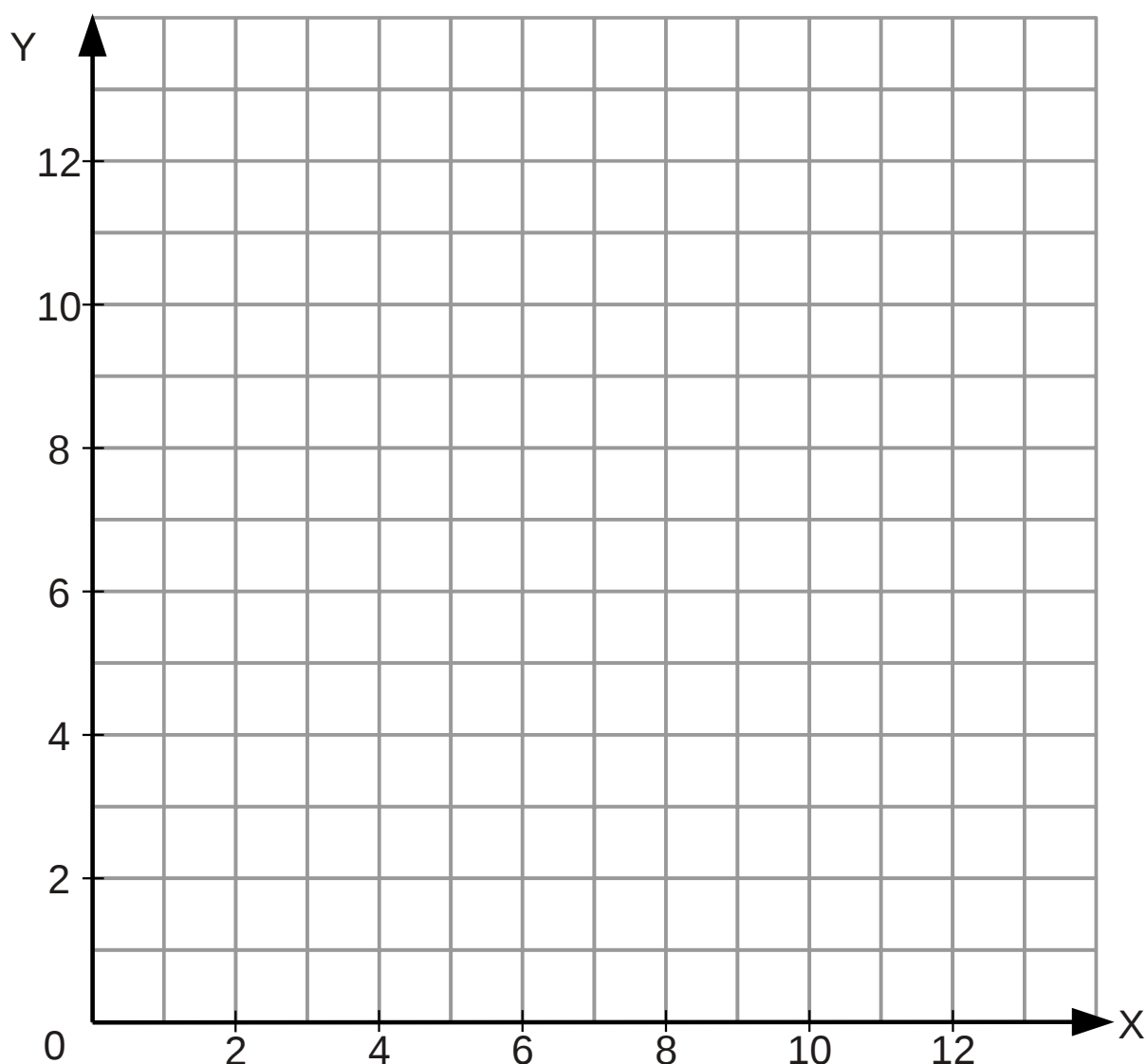
Plotting a straight line graph from a formula

A line has formula $y = 2x + 1$

Complete the table of values below using this formula

X	0	1	2	3	4
Y	1			7	

Plot the graph of $y = 2x + 1$ on the axes below...



Plot the line $y = 2x + 4$ on the same axes.

What do you notice about the two lines?

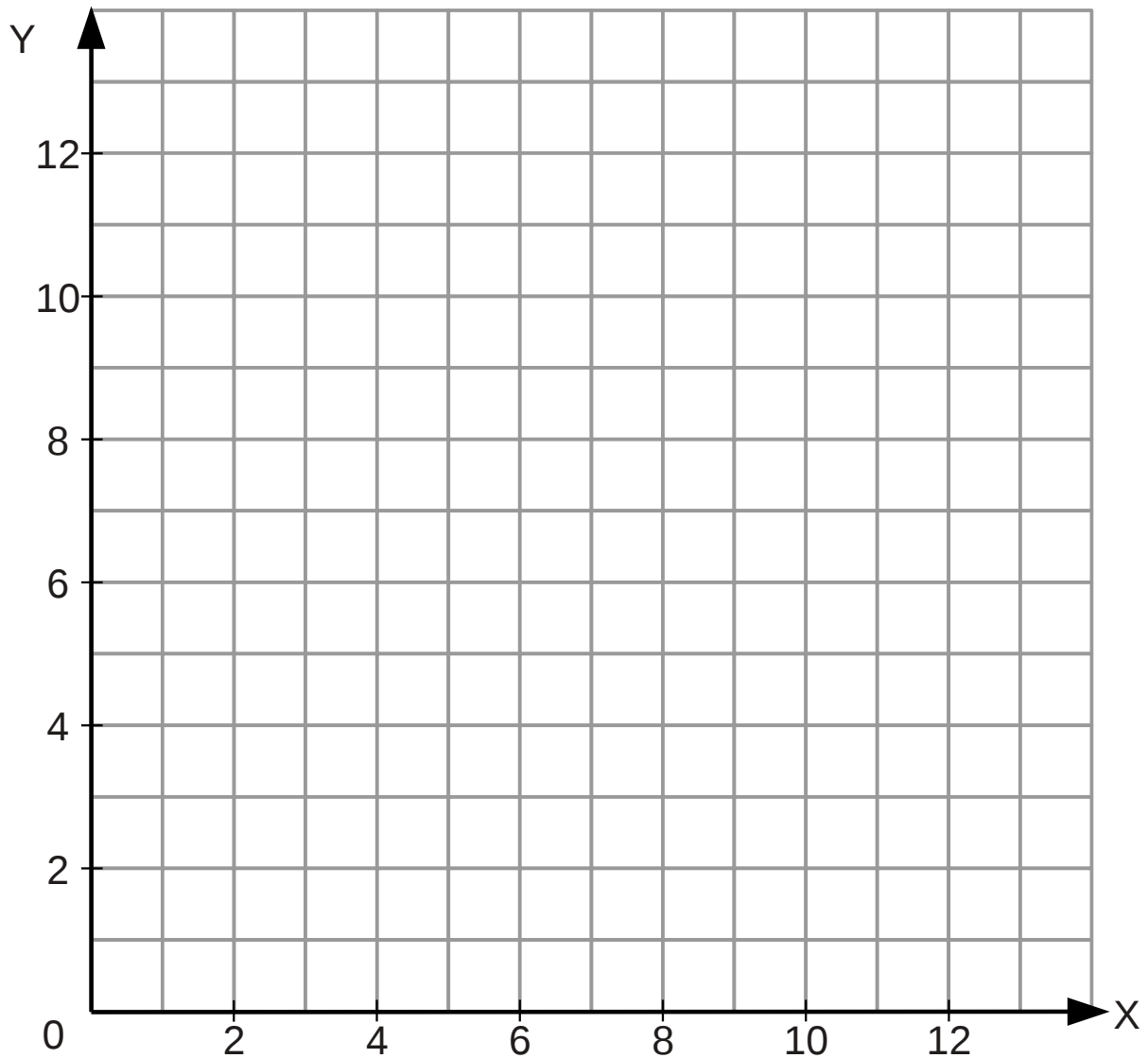
Plotting a curve from a formula

A curve has the formula $y = \frac{12}{x}$

Complete the table of values below using this formula

x	1	2	3	4	6	8	12
y							

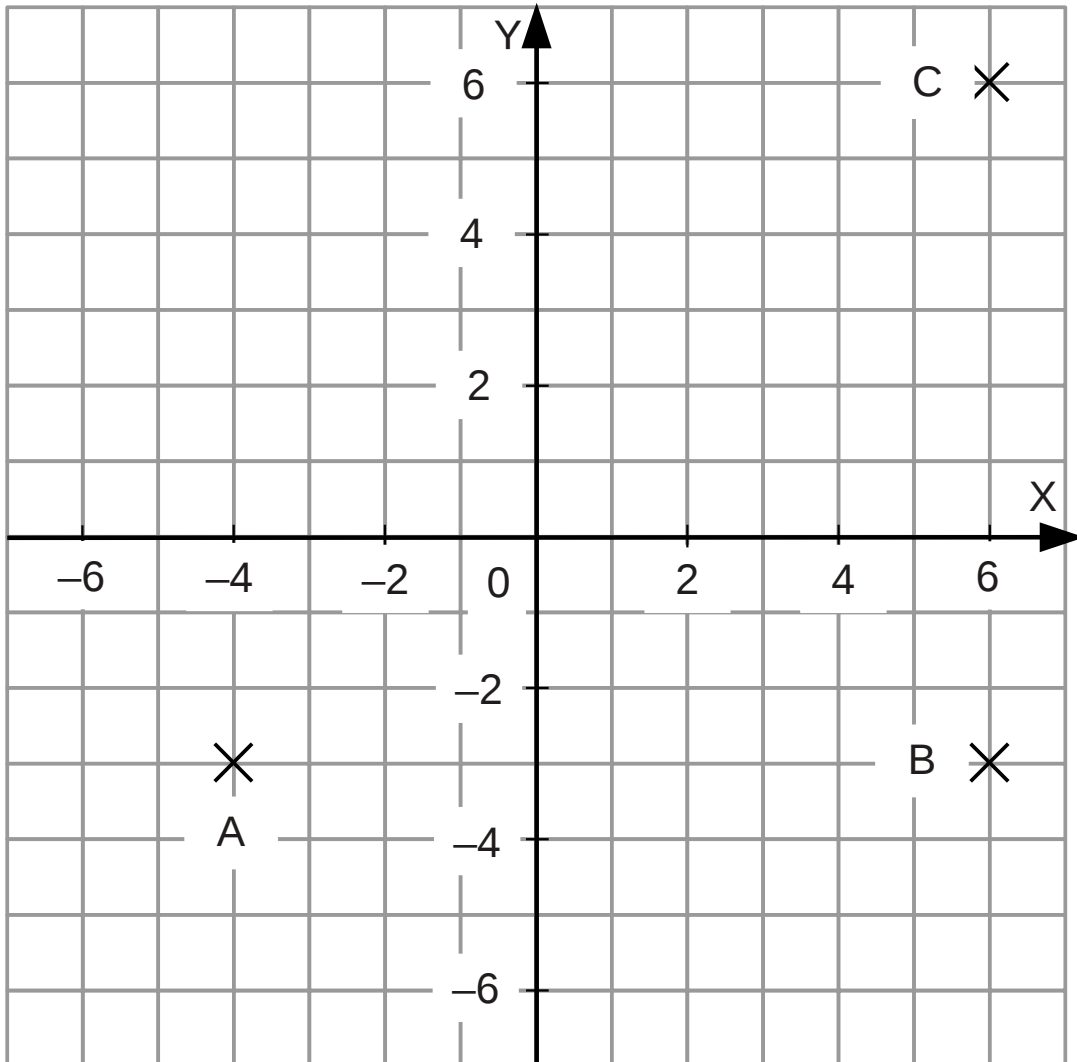
Plot the graph of $y = \frac{12}{x}$ on the axes below...



All four quadrants

Question 1

Three points A, B, C are plotted on the grid below

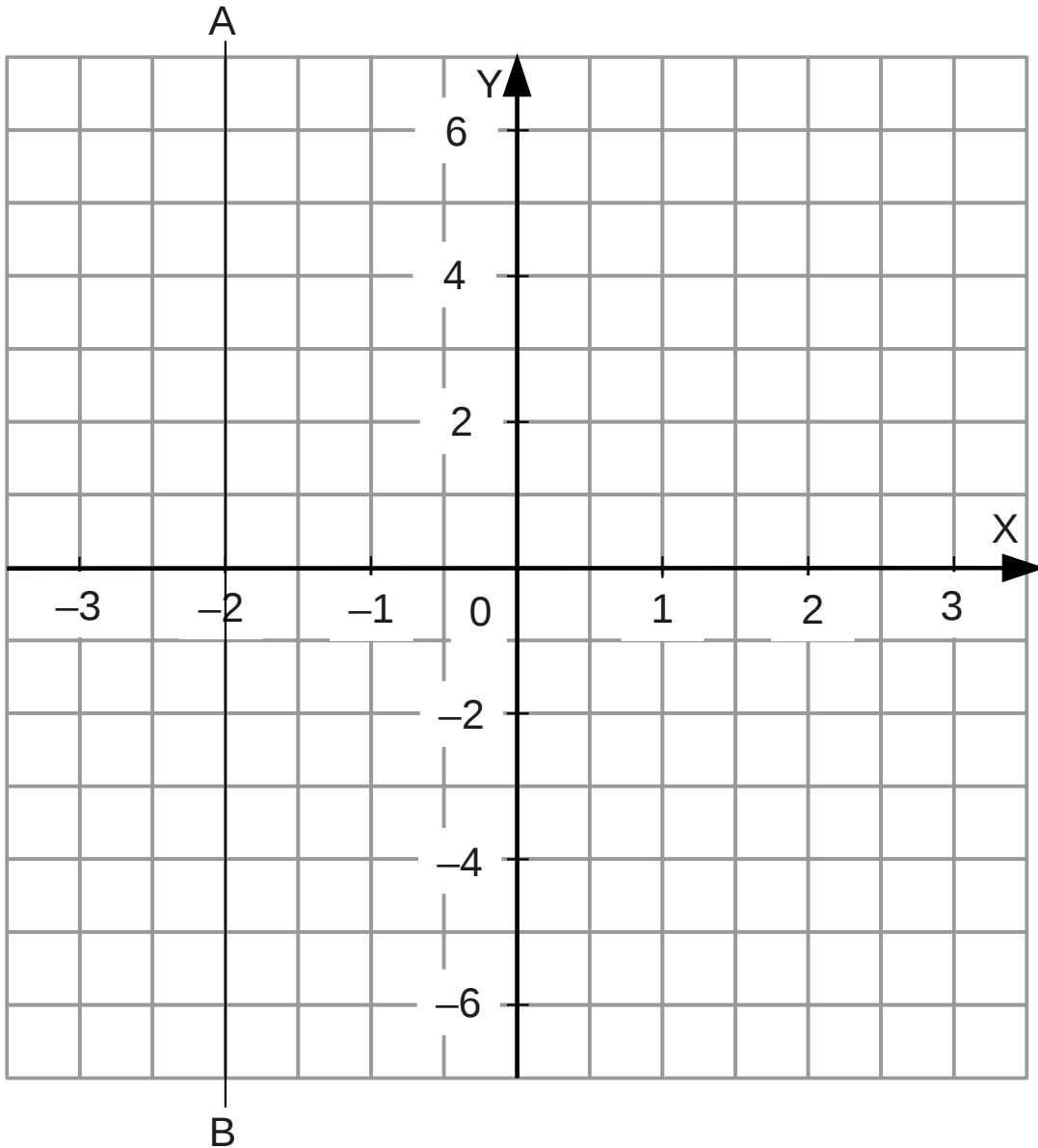


- Write down the coordinates of each of the points A, B, C
- Plot a point D so that ABCD are the vertices of a rectangle
- Draw the lines AC and BD on the grid
- Write down the coordinates of the point where AC crosses BD
- Work out the perimeter of the rectangle ABCD
- Work out the area of the rectangle ABCD
- Challenge:** work out the length of AC using Pythagoras' result

Question 2

A vertical line AB is shown on the grid below.

Note that the X and Y axes are scaled differently.



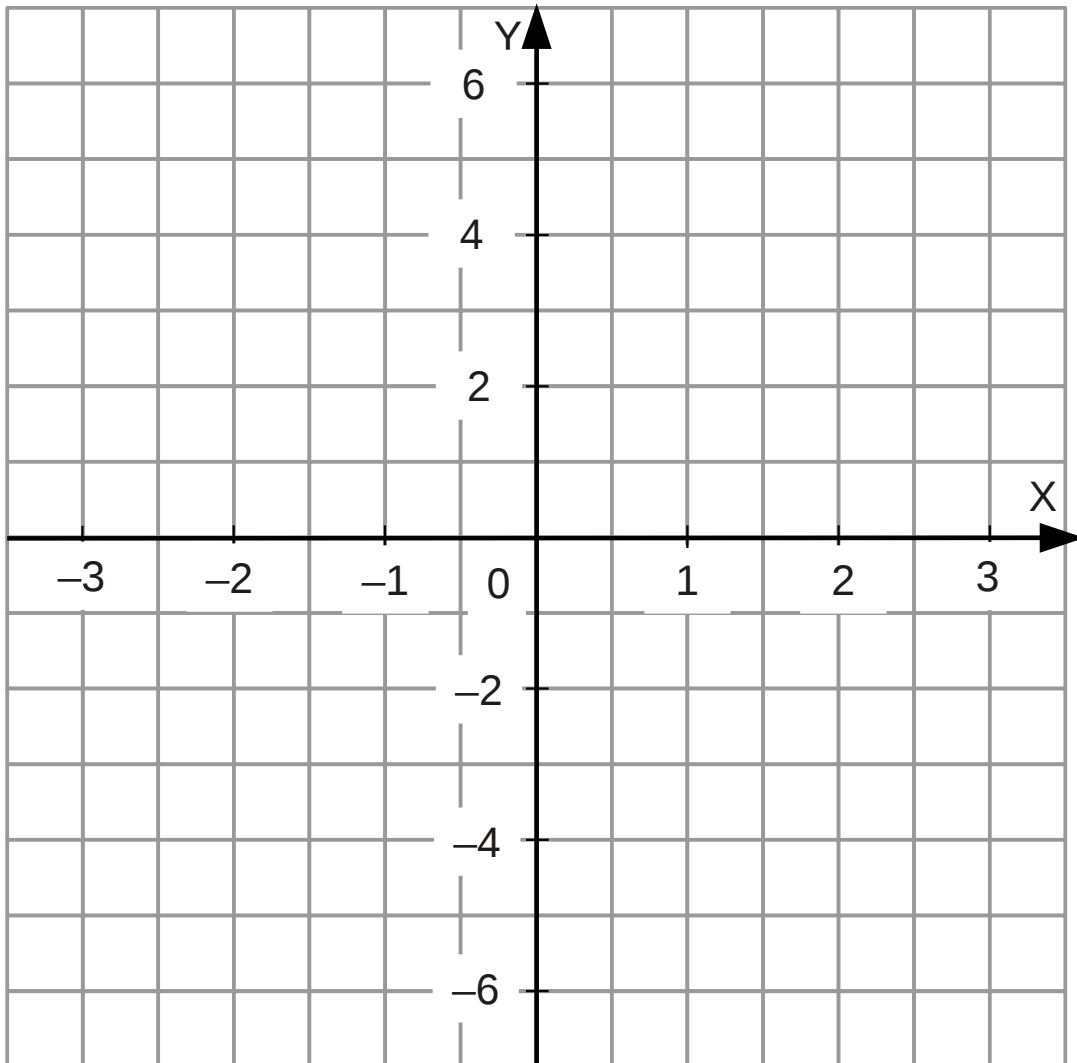
- Write down the equation of the line AB
- Draw the graph of $y=3x-1$ on the grid above
- Draw the graph of $2y+x=2$
Hint: rearrange to make y the subject of the formula
- Pairs of lines on the graph will cross each other at three points
Label these three points and draw the triangle they form.

Question 3

Plot a graph of the formula $y = x^2 - x - 2$ on the grid below

Hint: make a table of y values values corresponding to x values from $x = -2$ to $x = +3$. Then plot the points and draw a smooth bowl shaped curve through the points.

Note the scales of the X and Y axes are different.



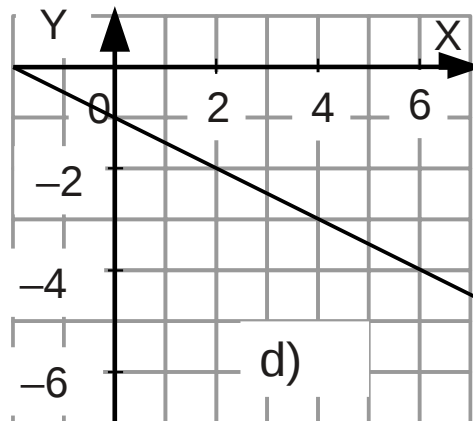
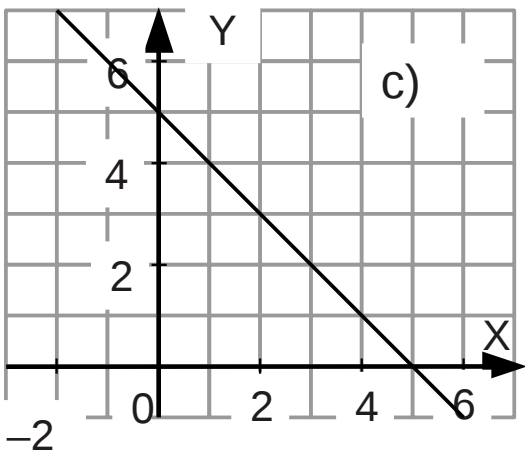
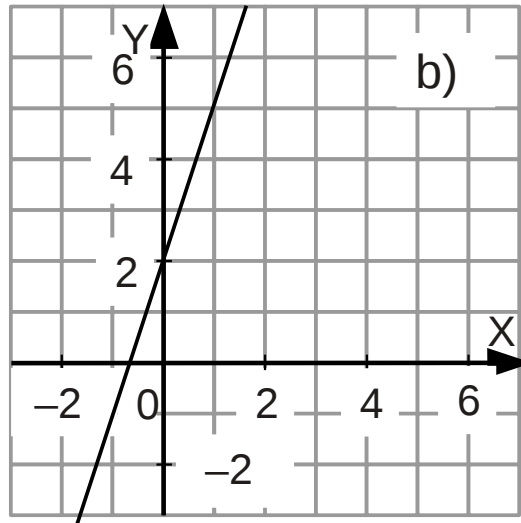
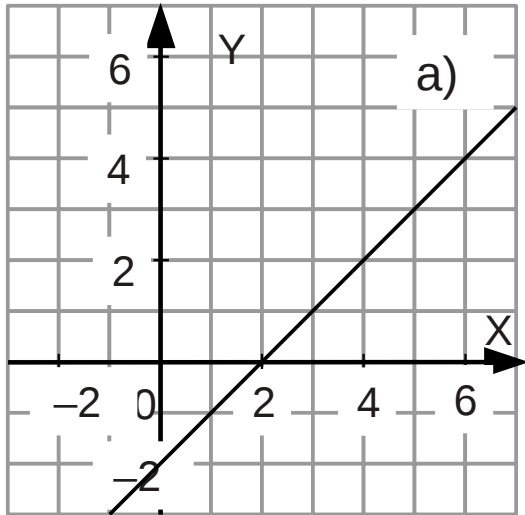
- Factorise $y = x^2 - x - 2$
- Mark with a cross the points where the curve crosses the X axis
- The curve is symmetrical. Draw the line of symmetry on the graph
- Write down the coordinates of the point at the minimum of the curve

Question 4

Below are four straight line graphs labelled a, b, c and d.

For each graph, work out the gradient and write down the intercept.

Then write down the equation of each of the graphs.



Question 5 (Challenge)

For each question below, find the equation of the straight line

- The line that passes through (0, 3) and (4, 11)
- The line that passes through (-2, -7) and (6, 9)
- The line that passes through (-2, 6) and (6, -2)
- The line with gradient 2 that passes through point (0, -3)
- The line with gradient -3 that passes through (2, 4)