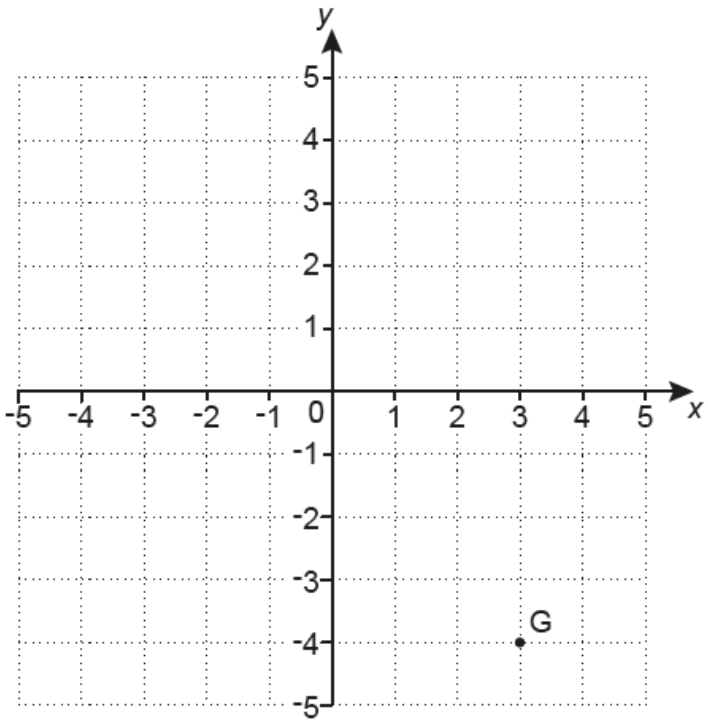
Graphs of equations and functions – 2021/20 GCSE Mathematics Foundation

1. Nov/2021/Paper_J560/01/No.8

Point G is shown on this grid.



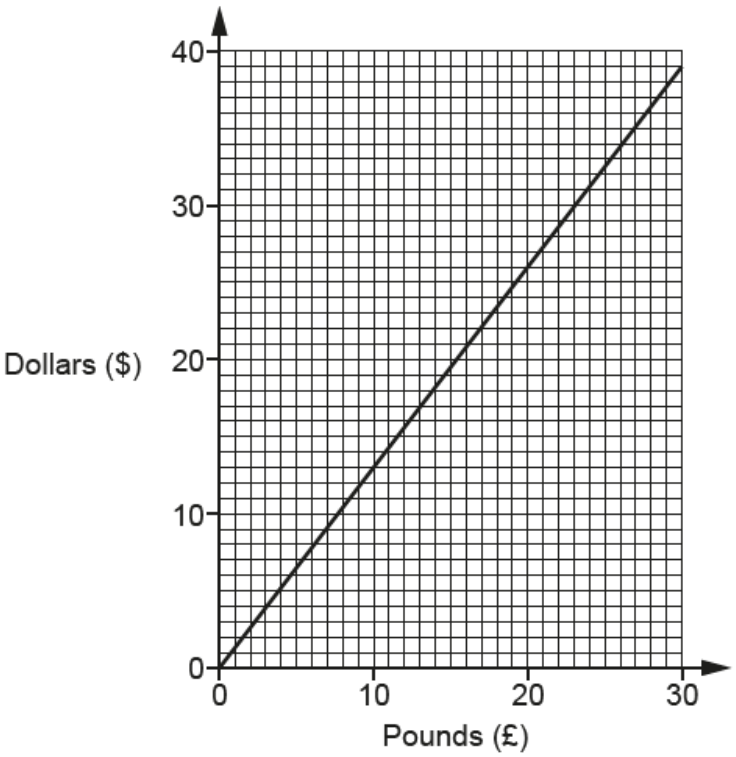
(a) Write down the coordinates of point G.

(a) (..... , ...) **[1]**

(b) Plot point H on the grid at (-2, 4). **[1]**

2. Nov/2021/Paper_J560/01/No.12

A conversion graph between pounds (£) and dollars ($) is shown below.



(a) Explain fully how the graph shows that the number of dollars is directly proportional to the number of pounds.

.....

..... **[2]**

(b) Use the conversion graph to change £20 into dollars.

(b) $ ..... **[1]**

(c) Some trainers cost £170 in the UK.
The same trainers cost $195 in the USA.

Show that the trainers cost less in the USA.

.....

..... **[4]**

(d) If the trainers are brought from the USA there is an extra charge for tax and delivery.

Alex wants to pay the lowest total amount for the trainers.

Write down the maximum extra charge for tax and delivery that Alex should be willing to pay.
Give your answer in dollars.

(d) $ ..... **[1]**

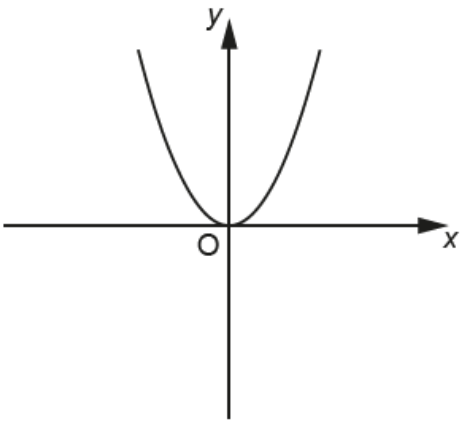
3. Nov/2021/Paper_J560/01/No.15

For each graph below, select its possible equation from this list.

A $y = x^3$ **B** $y = -2$ **C** $y = -x$

D $x = -2$ **E** $y = x^2$ **F** $y = 2x + 1$

Write the letter of the equation beneath each graph.



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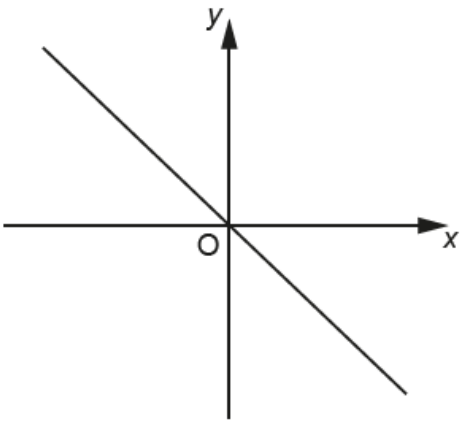

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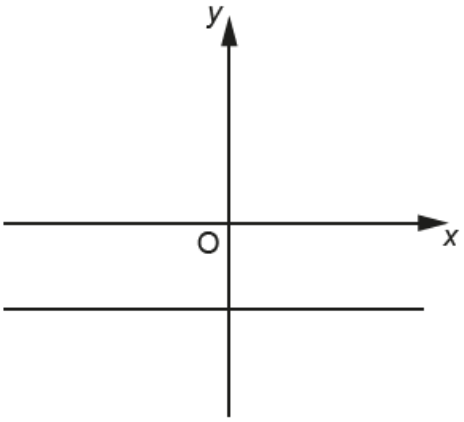

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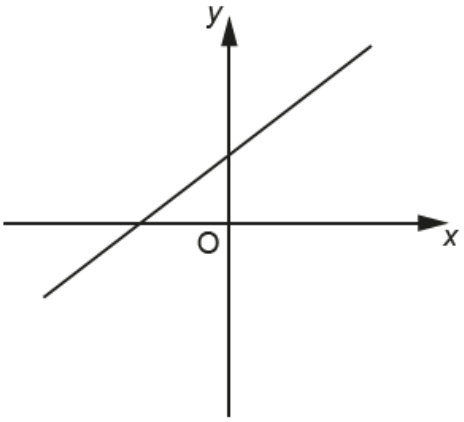
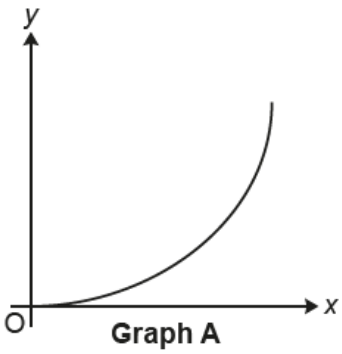


.....

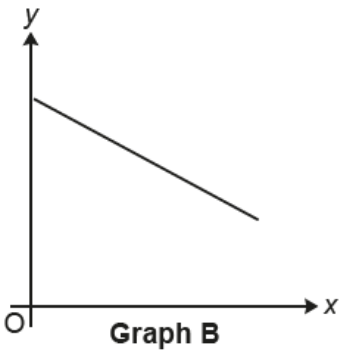
[4]

4. Nov/2021/Paper_J560/02/No.16

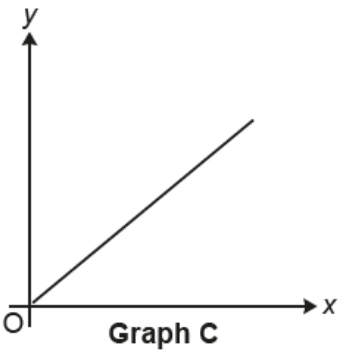
Here are sketches of five graphs.



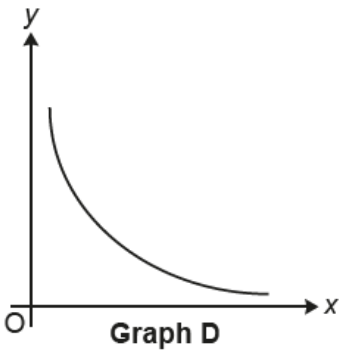
Graph A



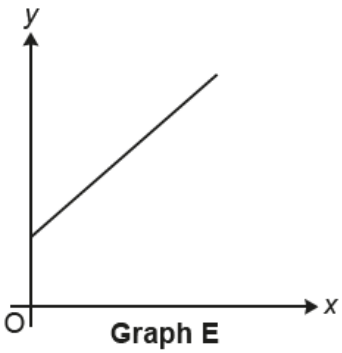
Graph B



Graph C



Graph D



Graph E

Write the letter of the graph that represents the following relationships.

(a) y is directly proportional to x.

(a) ..... **[1]**

(b) y is inversely proportional to x.

(b) ..... **[1]**

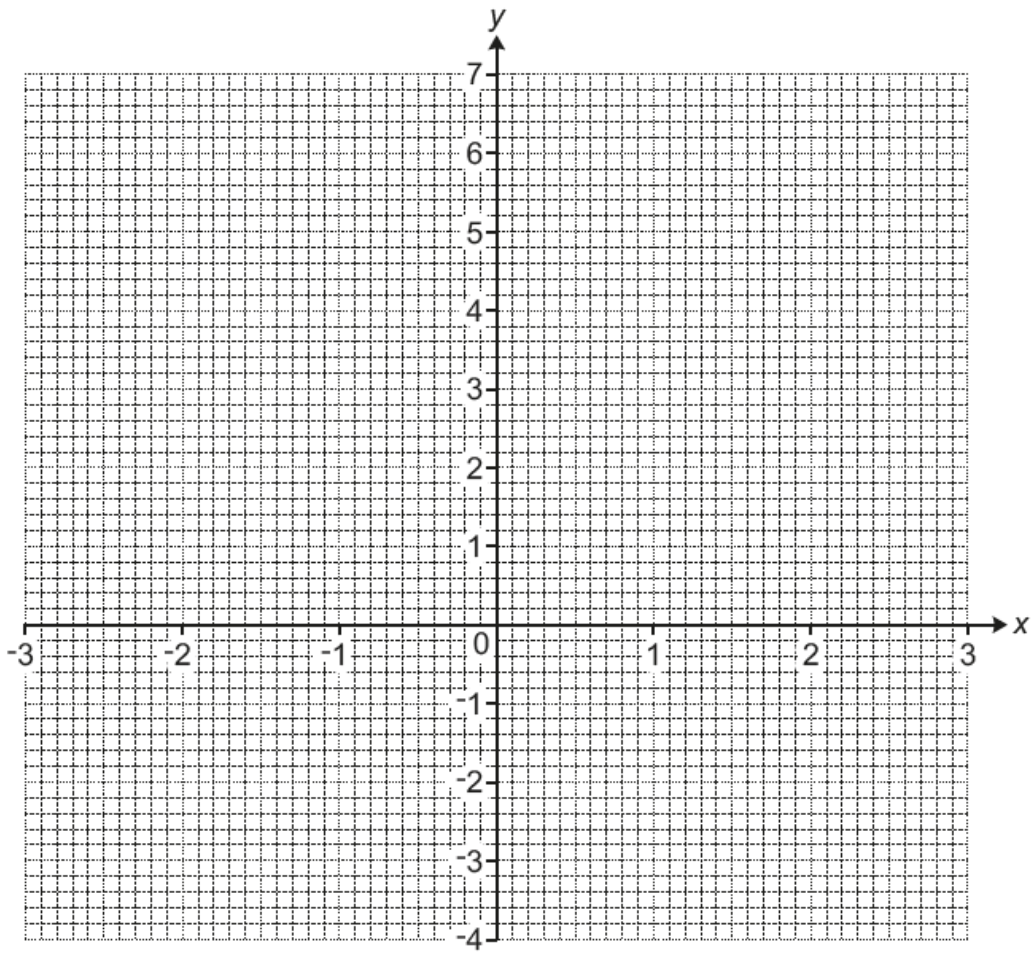
5. Nov/2021/Paper_J560/02/No.21

(a) Complete this table for $y = x^2 - 3$.

x	-3	-2	-1	0	1	2	3
y		1	-2		-2	1	6

[2]

(b) Draw the graph of $y = x^2 - 3$ for values of x from -3 to 3.



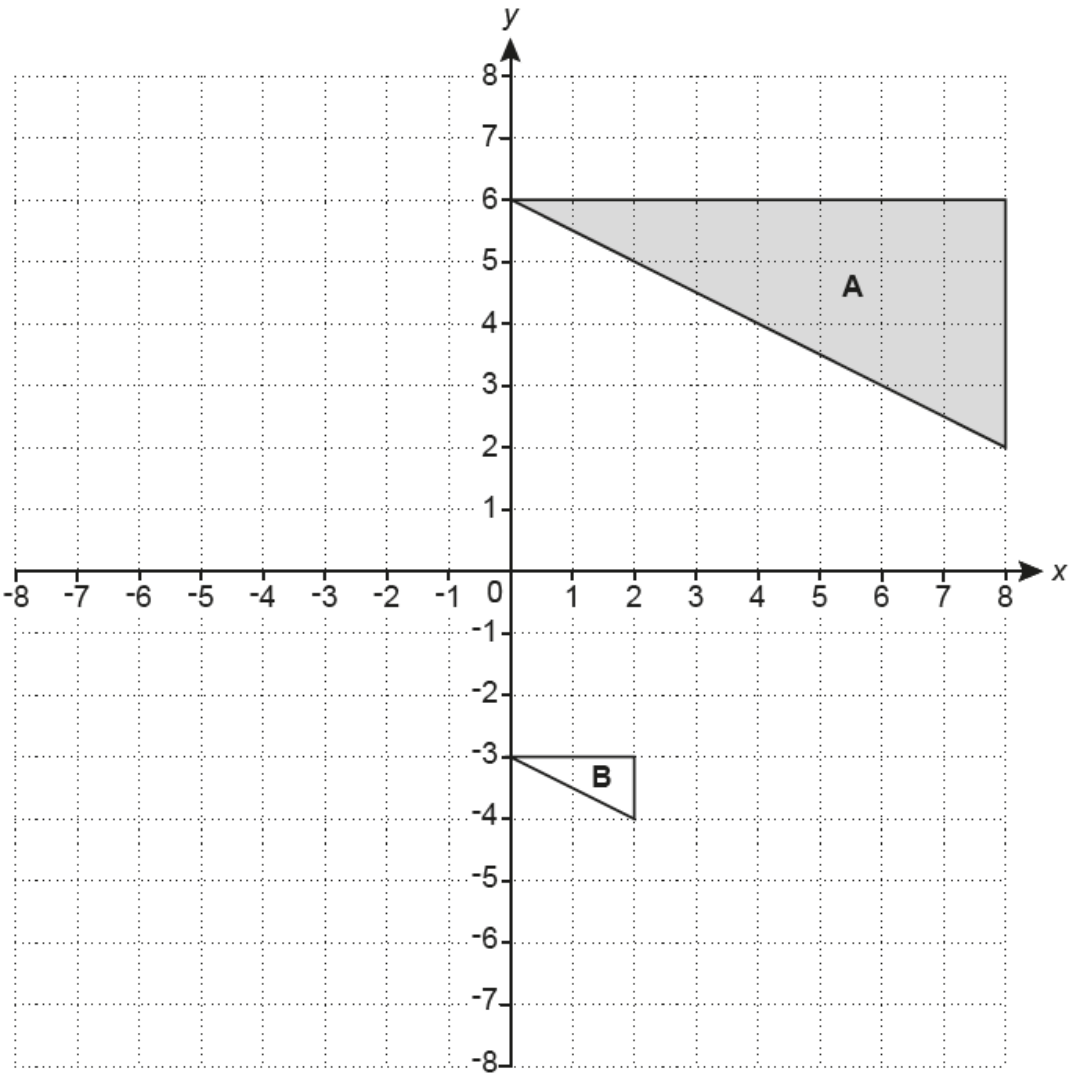
[3]

(c) Use your graph to solve $x^2 - 3 = 2$.

(c) $x =$ ..... or $x =$ ..... **[2]**

6. Nov/2021/Paper_J560/03/No.16

Triangle **A** and triangle **B** are drawn on the coordinate grid.



(a) Reflect triangle **A** in the line $x = 0$. **[2]**

(b) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....

..... **[3]**

7. Nov/2021/Paper_J560/03/No.21

(a) A straight line has the equation $y = 2x - 1$.

Write down the gradient of the line.

(a) ..... **[1]**

(b) Here are the equations of four straight lines.

$y = 2x + 3$ $\quad y = 1 - x$ $\quad y = \frac{1}{2}x + 4$ $\quad y = x - 1$

(i) Which of the four straight lines is parallel to $y = 2x - 1$?

(b)(i) ..... **[1]**

(ii) A student says

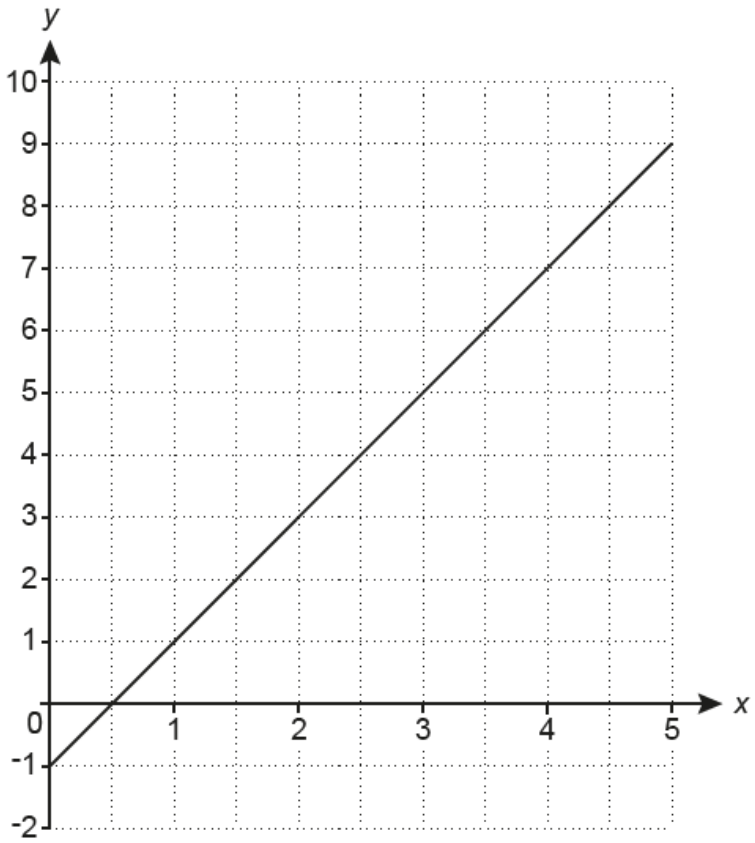
$y = \frac{1}{2}x + 4$ is the steepest of the four straight lines because it has the largest number added.

Explain why the student is wrong.

.....

..... **[1]**

(c) Here is part of the graph of $y = 2x - 1$.



The line continues to the right.

Will the line pass above, below or through the point (45, 90)?
Show how you decide.

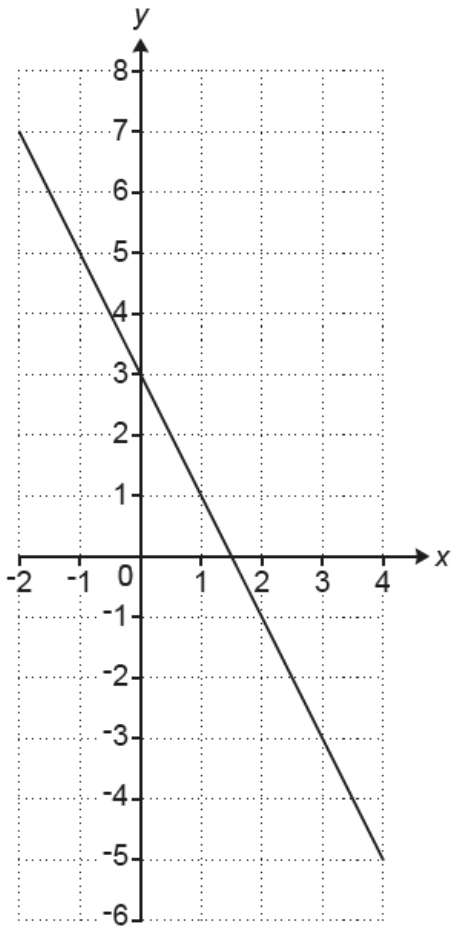
The line $y = 2x - 1$ will pass ..... the point (45, 90) because .....

.....

..... **[2]**

8. Nov/2020/Paper_J560/01/No.22

This graph shows part of a straight line.



(a) Write down the *y*-intercept.

(a) ..... **[1]**

(b) Show that the gradient of the line is -2. **[1]**

(c) Write down the equation of the line.

(c) ..... **[1]**

(d) The line continues to the right.

Will this line pass through the point (50, ⁻103)?
Show how you decide.

..... because .....

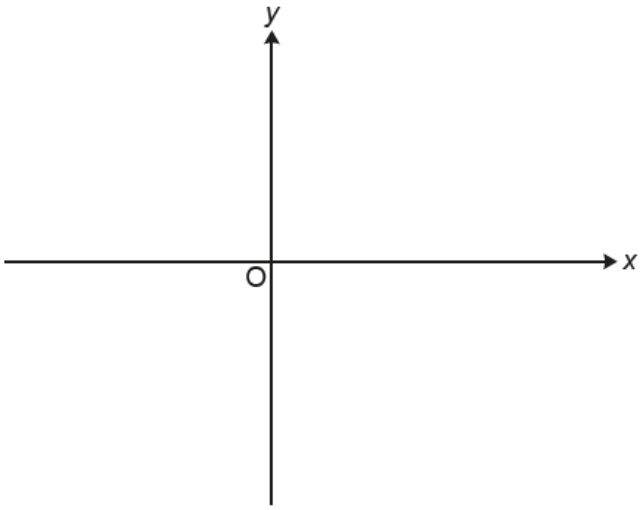
..... **[2]**

9. Nov/2020/Paper_J560/02/No.14

(a) (i) Sketch the graph of $x = 3$.
Show clearly the value of any intercepts.

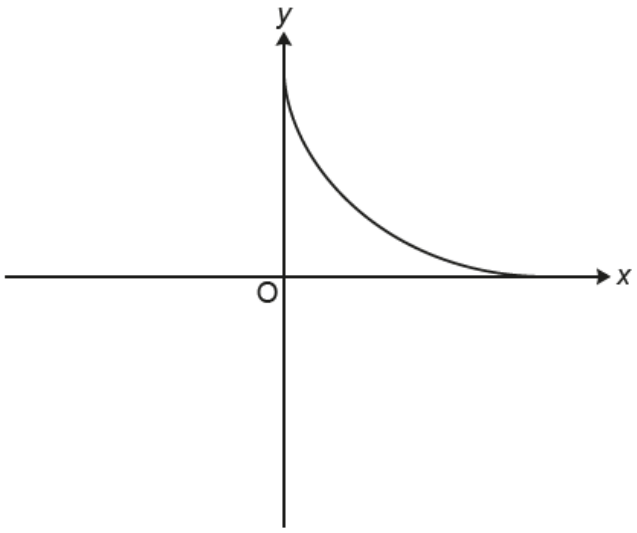
[2]

(ii) Sketch the graph of $y = x^2 + 1$.
Show clearly the value of any intercepts.



[2]

(b) Toby has sketched the graph of $y = \frac{1}{x}$ below.



Make two comments about the accuracy of his sketch.

1 .....

.....

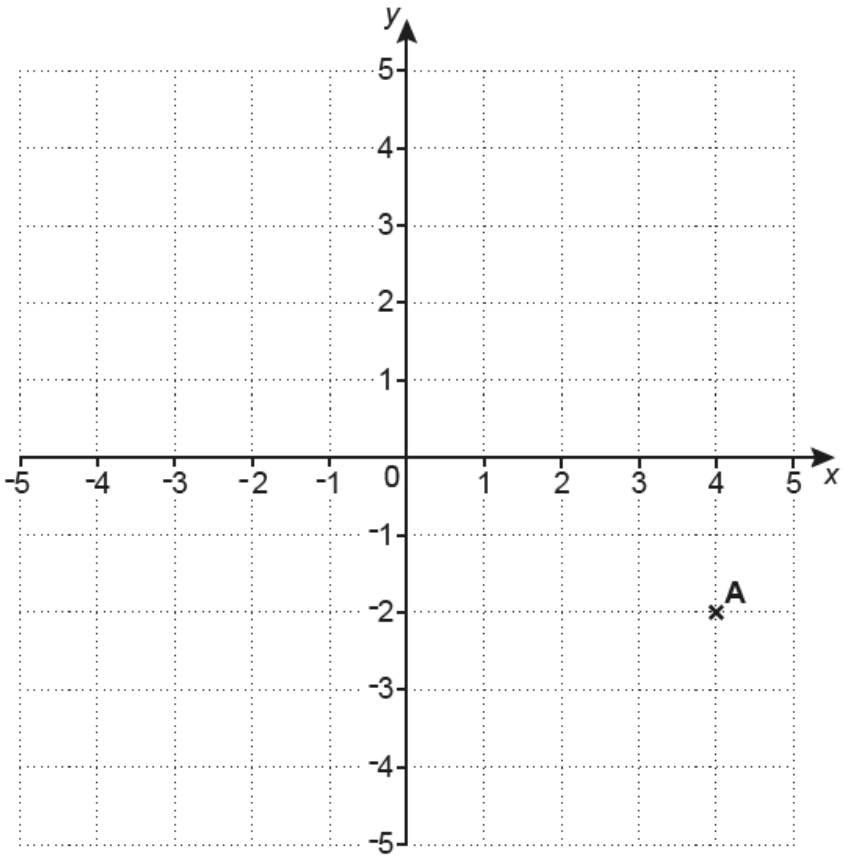
2 .....

.....

[2]

10. Nov/2020/Paper_J560/03/No.7

Point **A** is plotted at (4, -2) on this one-centimetre square grid.



Point **A** is a corner of a square with area 36 cm^2.
The other corners of the square have integer coordinates and lie on the grid.

Find the coordinates for the corner of the square that is diagonally opposite point **A**.
You may use the grid above to help you.

(..... , ...) **[3]**

11. Nov/2020/Paper_J560/03/No.22

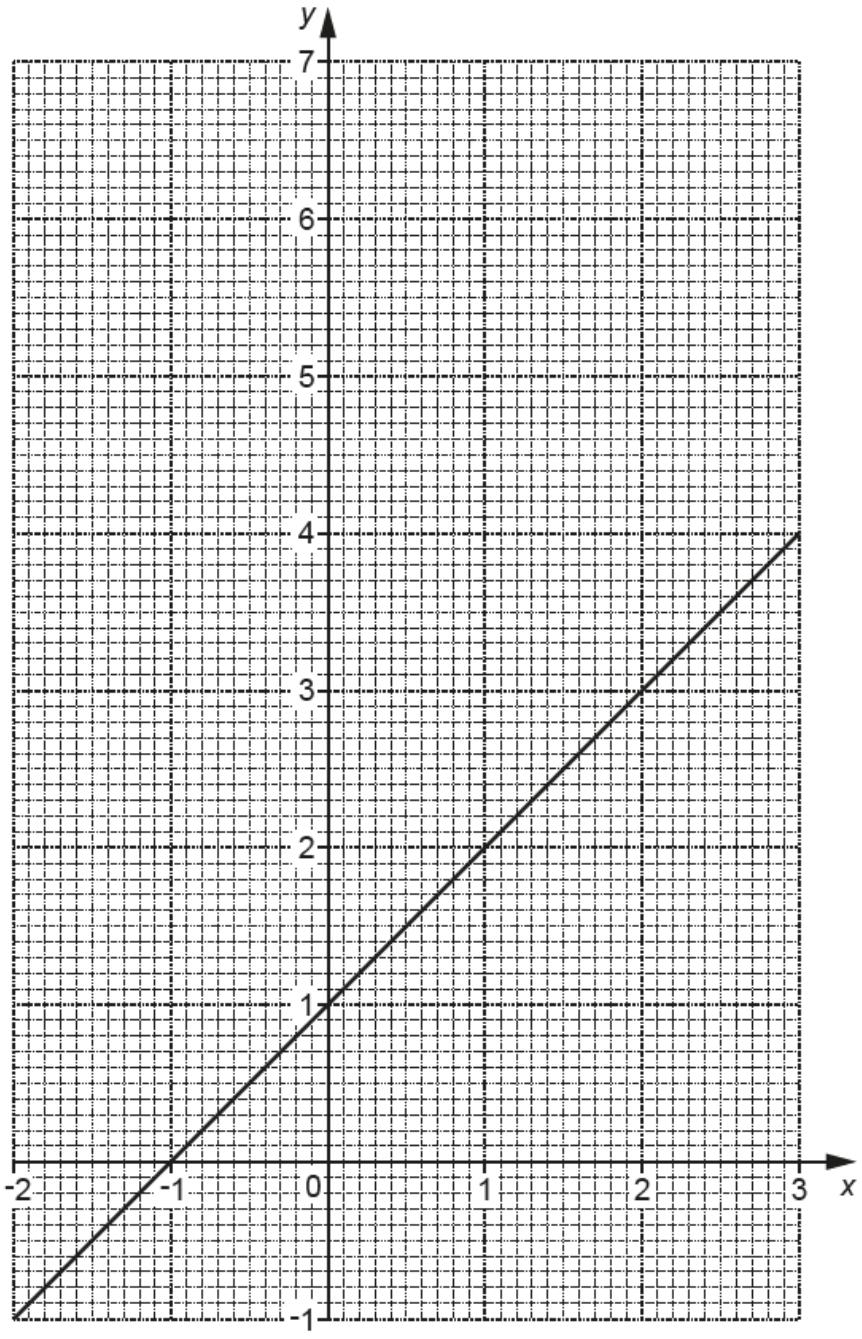
(a) Complete this table for $y = x^2 - x$.

x	-2	-1	0	1	2	3
y	6		0		2	6

[2]

(b) The graph of $y = x + 1$ is shown on the grid.

On the same grid, use part **(a)** to draw the graph of $y = x^2 - x$ for values of x from -2 to 3.



[3]

(c) Write down the x-coordinates of the points where $y = x^2 - x$ and $y = x + 1$ cross.

(c) $x =$ ..... and $x =$ ..... **[2]**