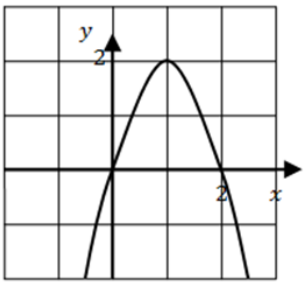
GCSE – Graph Transformations

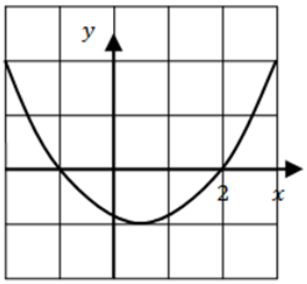
Mini-Exercise

$y = f(x)$	$(4,3)$	$(1,0)$	$(6,-4)$
$y = f(x+1)$			
$y = f(x) - 1$			
$y = f(-x)$			
$y = -f(x)$			
$y = f(2x)$			
$y = 3f(x)$			
$y = f\left(\frac{x}{4}\right)$			

Test Your Understanding

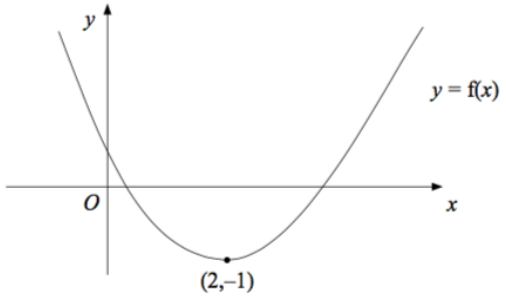


Sketch $y = f(x) + 1$



Sketch $y = f(x - 1)$

Question 1



The diagram shows part of the curve with equation $y = f(x)$.The minimum point of the curve is at (2,–1)

Write down the coordinates of the minimum point of the curve with equation $y = f(x + 2)$

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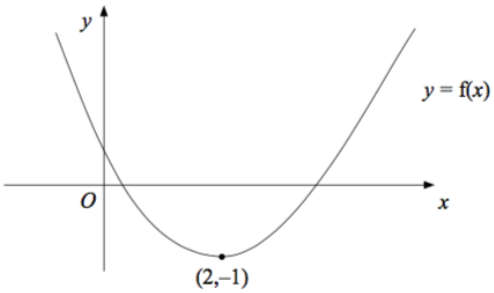
Question 2



The diagram shows part of the curve with equation $y = f(x)$. The minimum point of the curve is at (2,–1)

Write down the coordinates of the minimum point of the curve with equation $y = 3f(x)$

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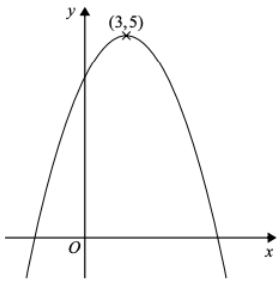
Question 3



The diagram shows part of the curve with equation $y = f(x)$ The coordinates of the maximum point of the curve are $(3,5)$.

Write down the coordinates of the maximum point of the curve with equation $y = f(3x)$

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Question 4

The curve with equation $y = f(x)$ has a maximum point at $(2,-7)$.

Find the coordinates of the minimum point of the curve with equation $y = -f(x)$

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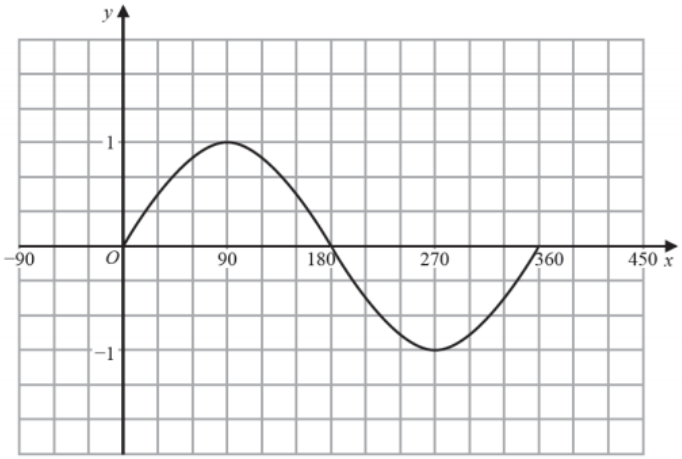
Question 5

Here is the graph of $y = \sin x^\circ$ for $0 \leq x \leq 360$



In $0 \leq x \leq 360$, the graph of

$y = \sin\left(\frac{x}{2}\right)^\circ + 3$ has a maximum at the point A.

Write down the coordinates of A.

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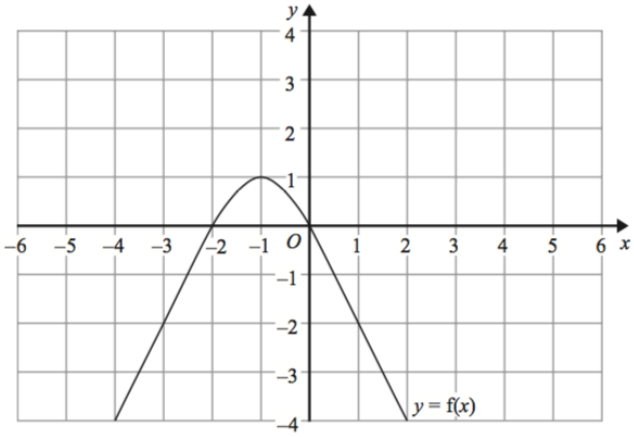
Question 6

The graph of $y = f(x)$ is shown on the grid.



The graph of $y = f(x)$ has a turning point at the point $(-1,1)$. Write down the coordinates of the turning point of the graph of $y = f(-x) + 2$

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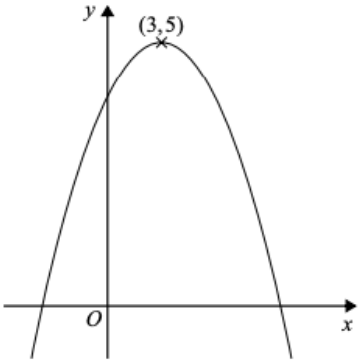
Question 7



The diagram shows part of the curve with equation $y = f(x)$ The coordinates of the maximum point of the curve are $(3,5)$. The curve with equation $y = f(x)$ is transformed to give the curve with equation

$$y = f(x) - 4$$

Describe the transformation.

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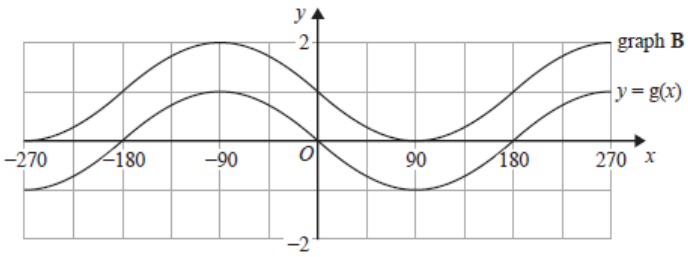
Question 8

The graph of $y = g(x)$ is shown on the grid.



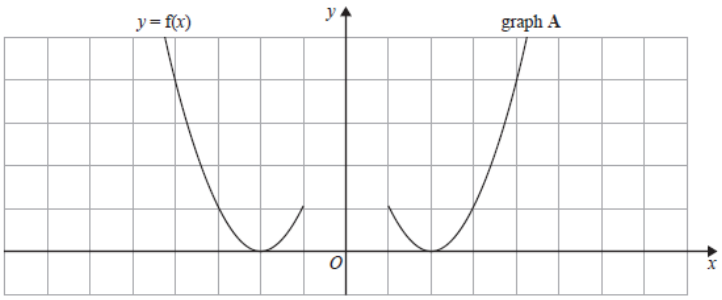
Graph B is a translation of the graph of $y = g(x)$.

Write down the equation of graph B.

$y =$ .....

Question 9

The graph of $y = f(x)$ is shown on the grid.



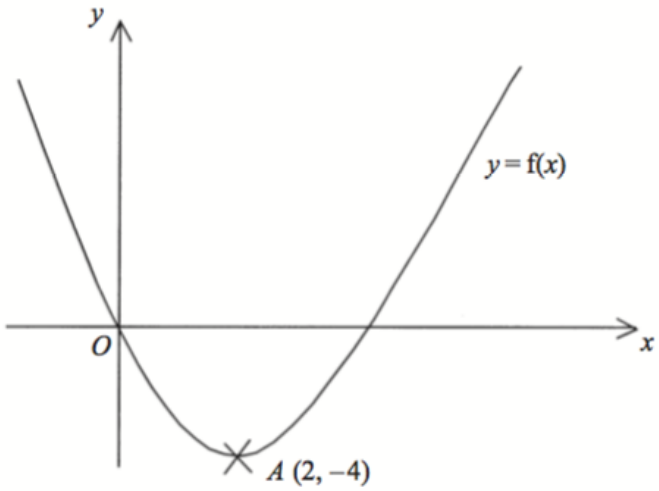
Graph A is a reflection of the graph of $y = f(x)$.

Write down the equation of graph A.

$y =$ .....

Question 10

This is a sketch of the curve with equation $y = f(x)$.
It passes through the origin O.



The only vertex of the curve is at $A(2, -4)$.

The curve with equation $y = x^2$ has been translated to give the curve $y = f(x)$.

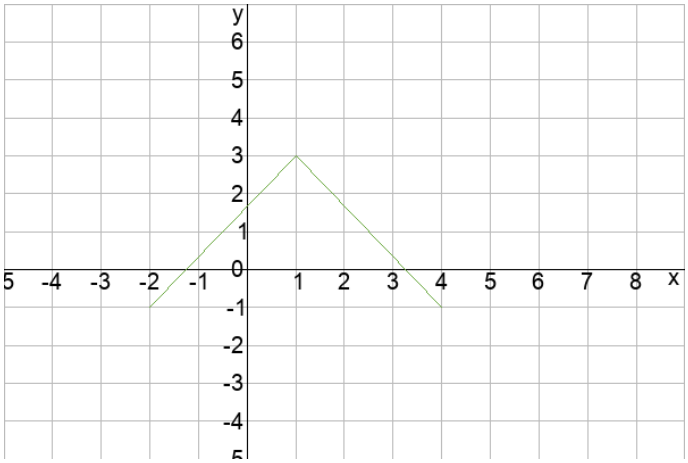
Find $f(x)$ in terms of x.

$f(x) =$ .....

Question 11

Here is the graph of $y = f(x)$

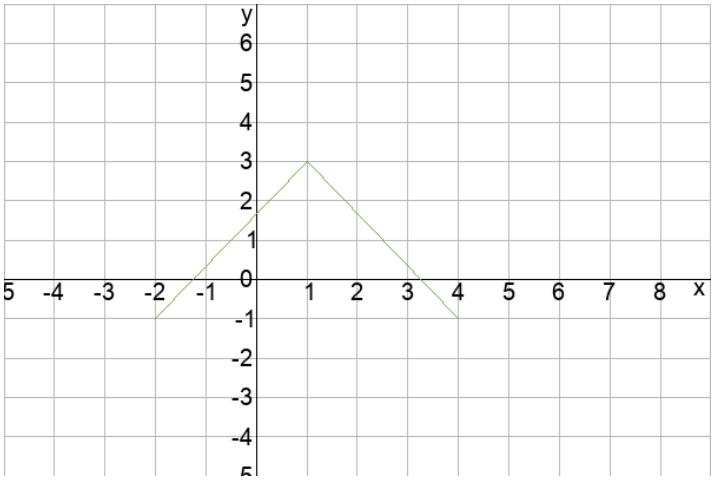
On the grid, draw the graph of $y = 2f(x)$



Question 12

Here is the graph of $y = f(x)$

On the grid, draw the graph of $y = f(-x)$



Question 13

The coordinates of the turning point of the graph of $y = x^2 - 8x + 25$ is $(4,9)$.

Hence describe the single transformation which maps the graph of $y = x^2$ onto the graph of $y = x^2 - 8x + 25$.

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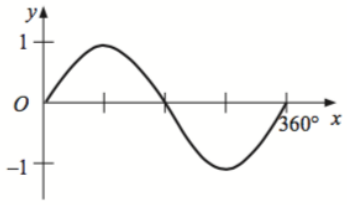
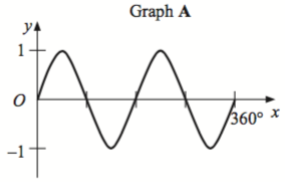
Question 14

Here is the graph of $y = \sin x$, where $0^\circ \leq x \leq 360^\circ$

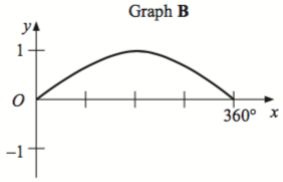


Match the following graphs to the equations.

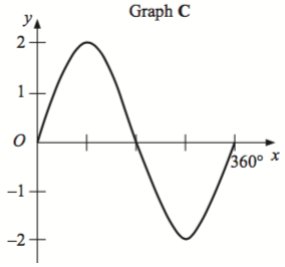
Graph A



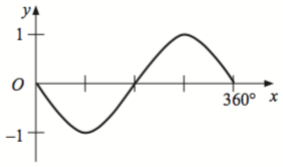
Graph B



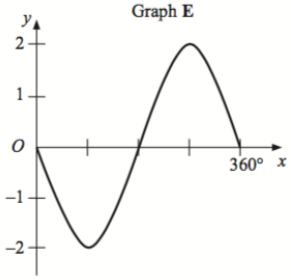
Graph C



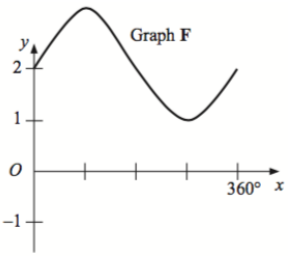
Graph D



Graph E



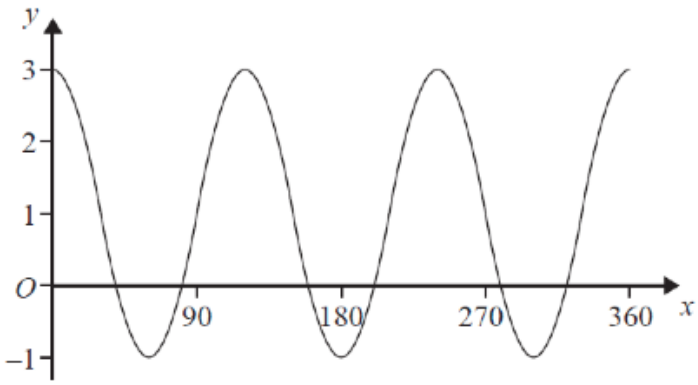
Graph F



Equation	Graph
$y = 2 \sin x$	.....
$y = -\sin x$	.....
$y = \sin 2x$	.....
$y = \sin x + 2$	.....
$y = \sin \frac{1}{2}x$	.....
$y = -2 \sin x$	.....

Question 15

Here is a sketch of the curve $y = a \cos bx^\circ + c$, $0 \leq x \leq 360$



Find the values of a, b and c.

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