



# Transformations of Graphs



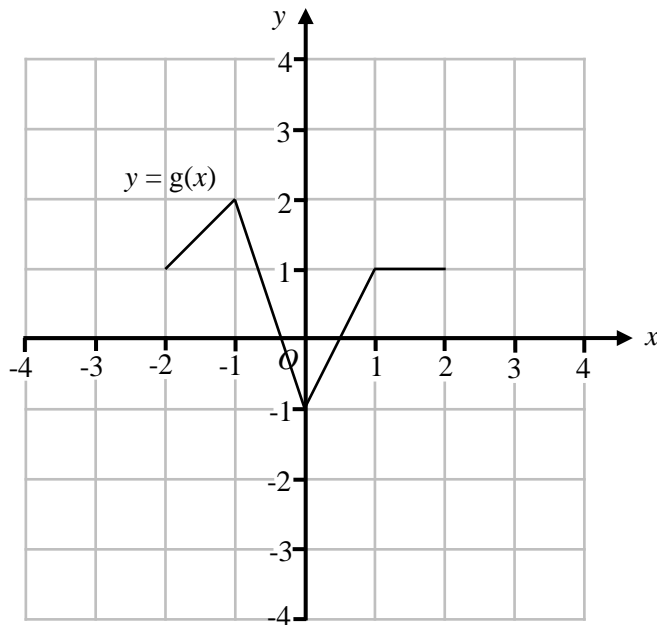
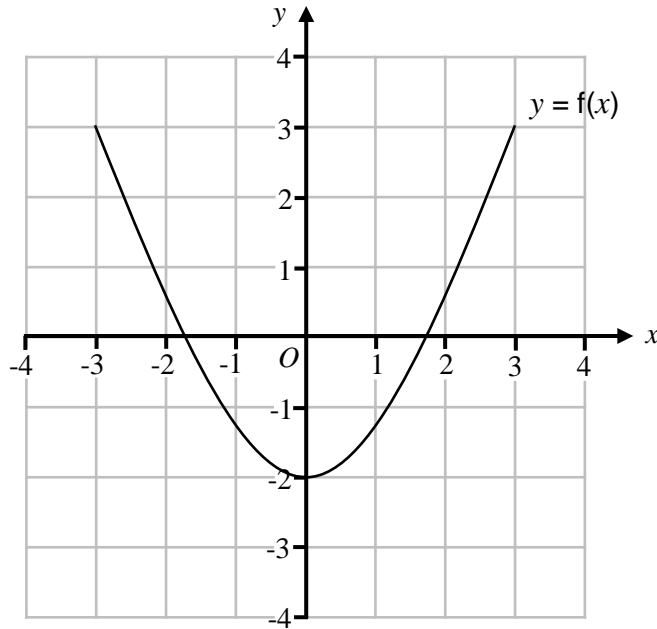
SCAN ME

REVISE THIS TOPIC

CHECK YOUR ANSWERS

SCAN ME

1 The graphs of  $y = f(x)$  and  $y = g(x)$  are shown on the grids below.

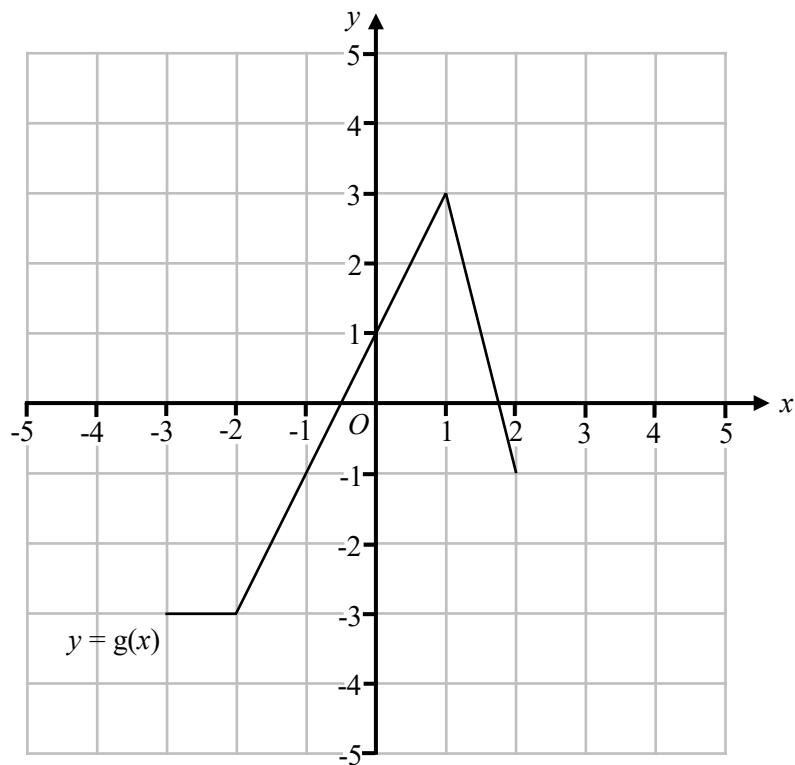
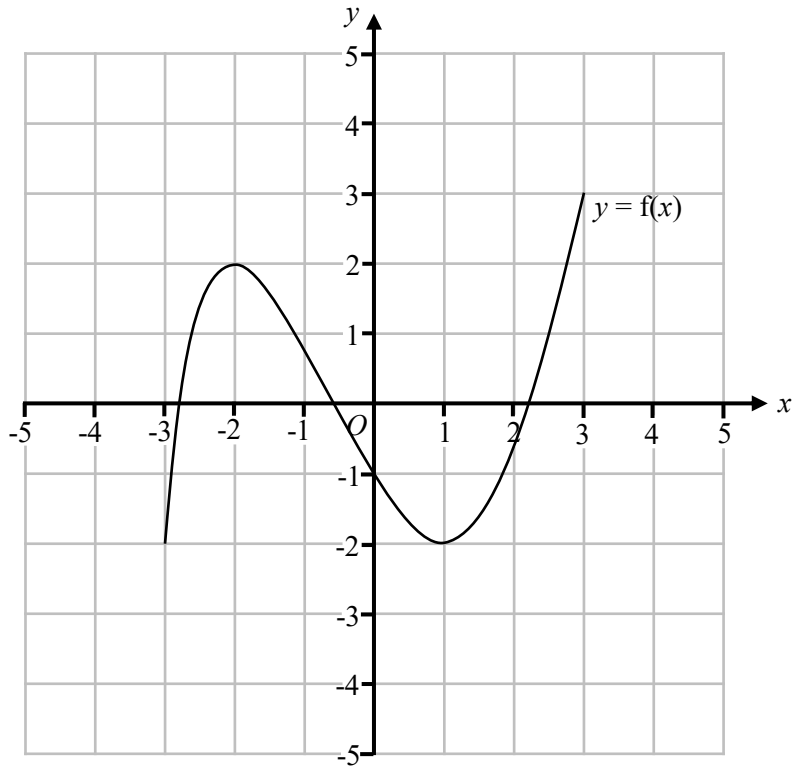


(a) Draw the graph of  $y = f(x) + 1$  onto the first grid. (1)

(b) Draw the graph of  $y = g(x) - 2$  onto the second grid. (1)

(Total for Question 1 is 2 marks)

2 The graphs of  $y = f(x)$  and  $y = g(x)$  are shown on the grids below.



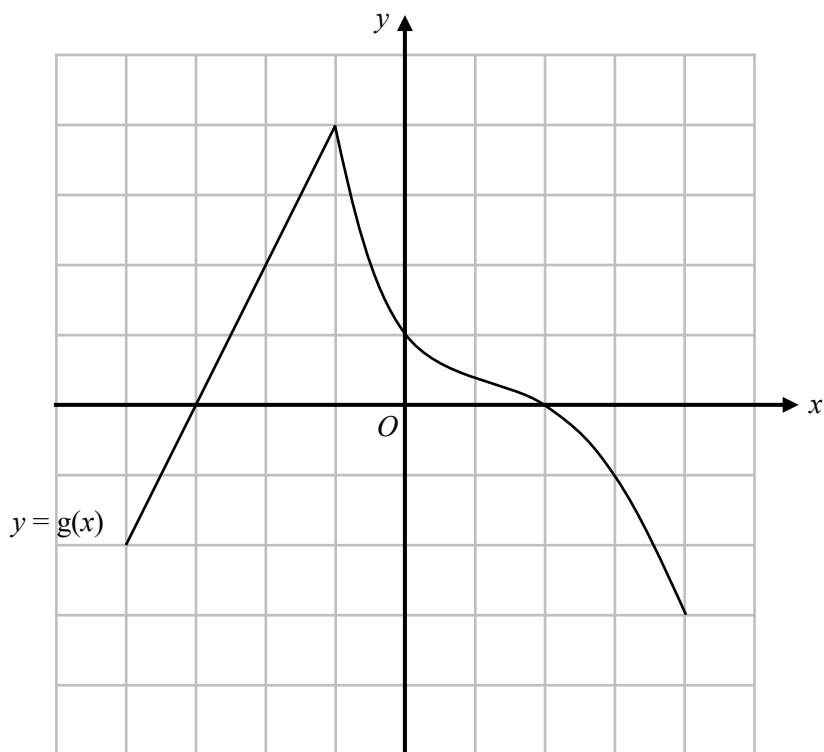
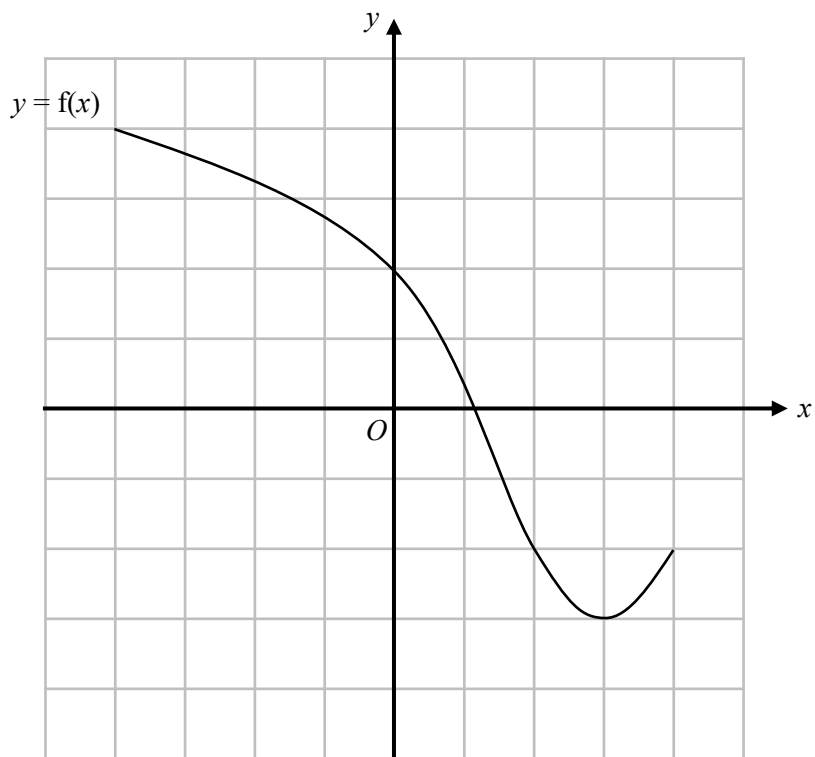
(a) Draw the graph of  $y = f(x + 1)$  onto the first grid. (1)

(b) Draw the graph of  $y = g(x - 2)$  onto the second grid. (1)

(Total for Question 2 is 2 marks)



3 The graphs of  $y = f(x)$  and  $y = g(x)$  are shown on the grids below.



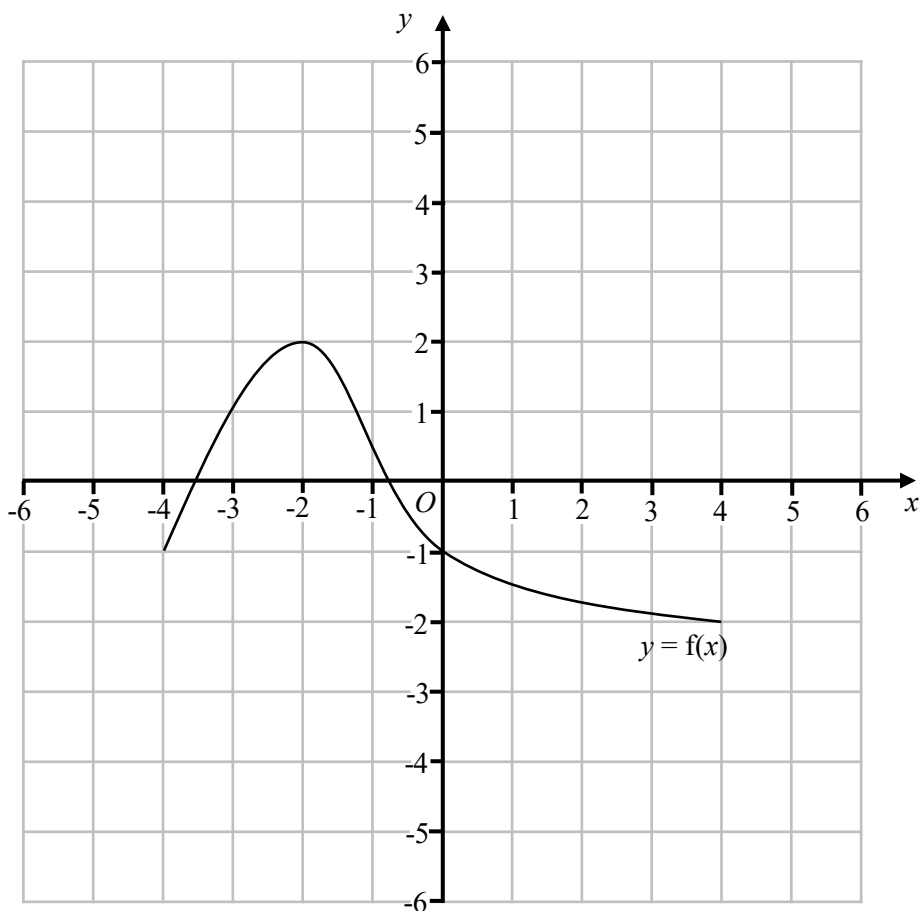
(a) Draw the graph of  $y = -f(x)$  onto the first grid. (1)

(b) Draw the graph of  $y = g(-x)$  onto the second grid. (1)

(Total for Question 3 is 2 marks)



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



(a) Draw the graph of  $y = f(x + 1) + 2$  onto the grid above. (2)

Point  $A(-2, 2)$  is on the graph  $y = f(x)$

When the graph of  $y = f(x)$  is transformed to the graph with equation  $y = f(-x)$  the point  $A$  is mapped to point  $B$ .

(b) Write down the coordinates of point  $B$ .

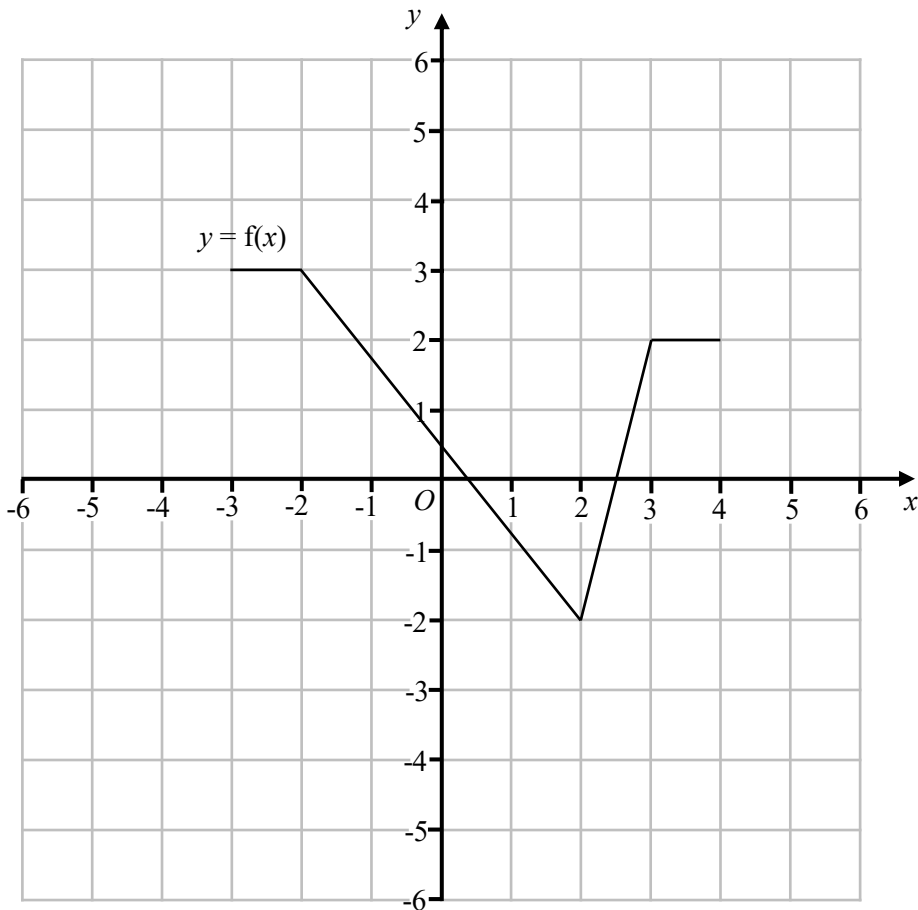
(....., .....)

(1)

(Total for Question 4 is 3 marks)



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



(a) Draw the graph of  $y = f(-x) - 2$  onto the grid above. (2)

Point  $A(4, 2)$  is on the graph  $y = f(x)$

When the graph of  $y = f(x)$  is transformed to the graph with equation  $y = -f(x + 7)$  the point  $A$  is mapped to point  $B$ .

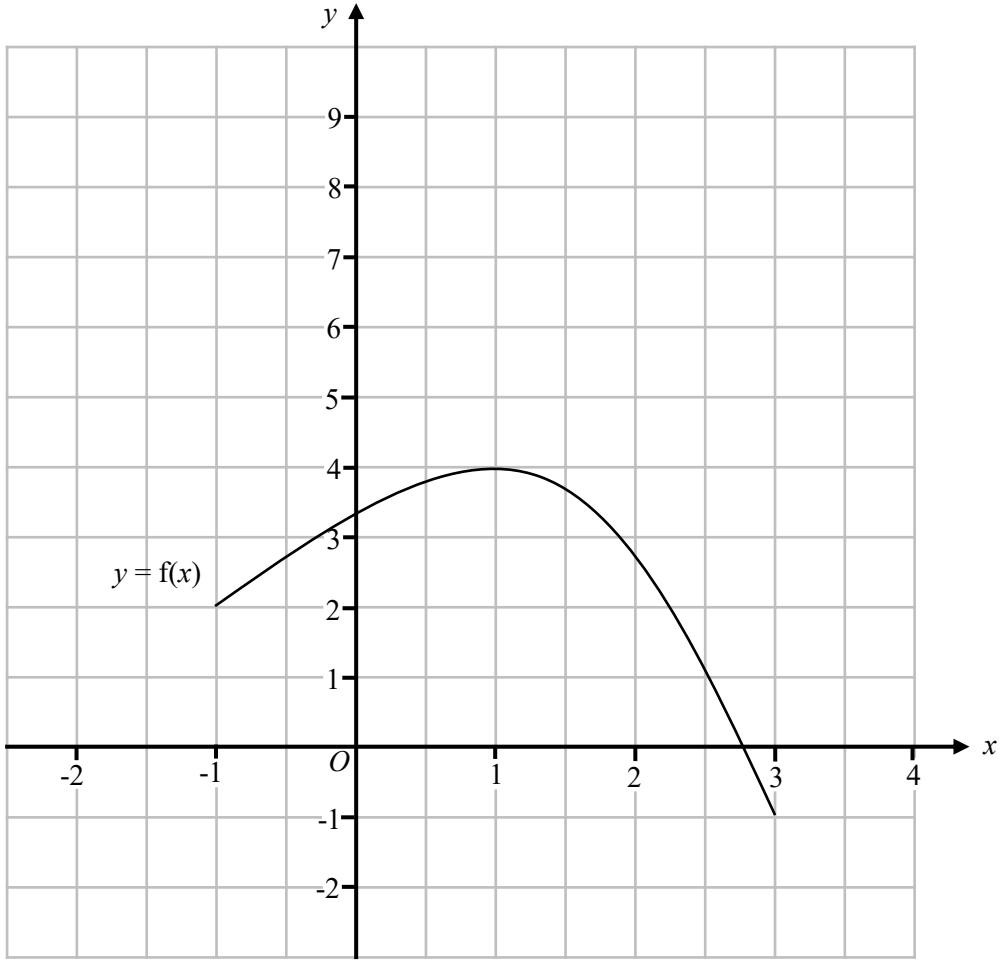
(b) Write down the coordinates of point  $B$ .

(....., .....) (2)

**(Total for Question 5 is 4 marks)**



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



(a) Draw the graph of  $y = f(x - 1) + 3$  onto the grid above. (2)

Point  $A(3, -1)$  is on the graph  $y = f(x)$

When the graph of  $y = f(x)$  is transformed to the graph with equation  $y = -f(-x)$  the point  $A$  is mapped to point  $B$ .

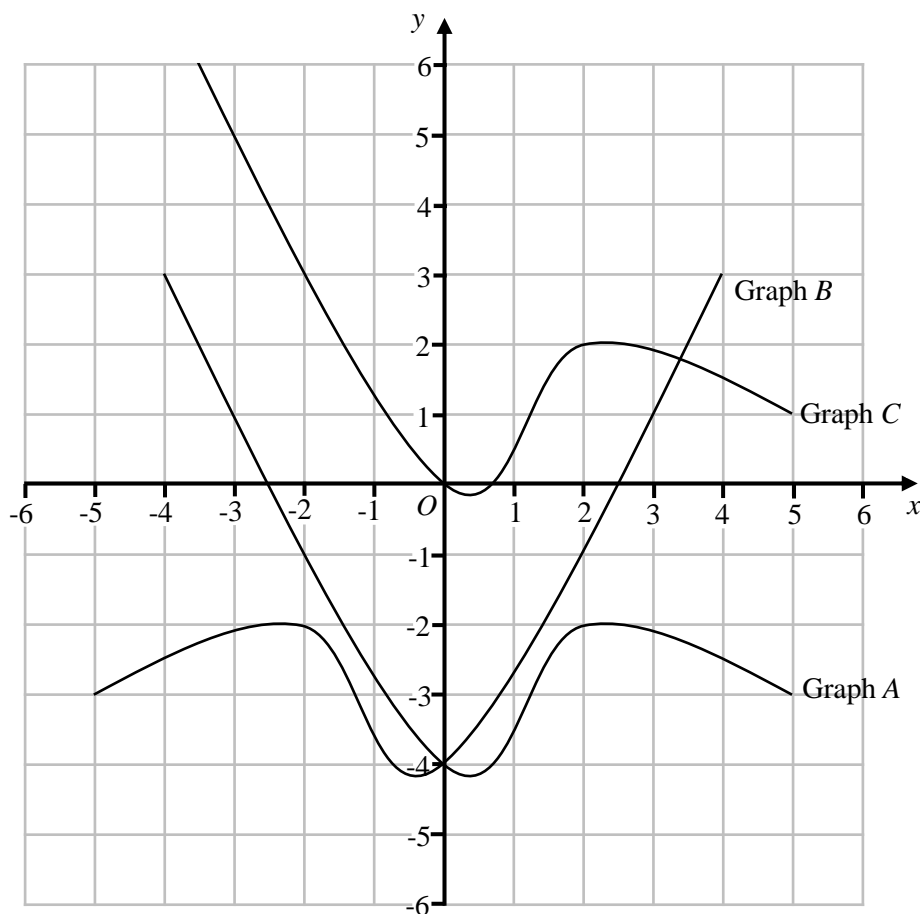
(b) Write down the coordinates of point  $B$ .

(....., .....) (2)

**(Total for Question 6 is 4 marks)**



7 The grid below shows the graphs  $A$ ,  $B$  and  $C$ .



On the grid above

- graph  $A$  has been reflected to give graph  $B$ .
- graph  $A$  has been translated to give graph  $C$ .

The equation of graph  $A$  is  $y = f(x)$

(a) Write down an equation of graph  $B$ .

..... (1)

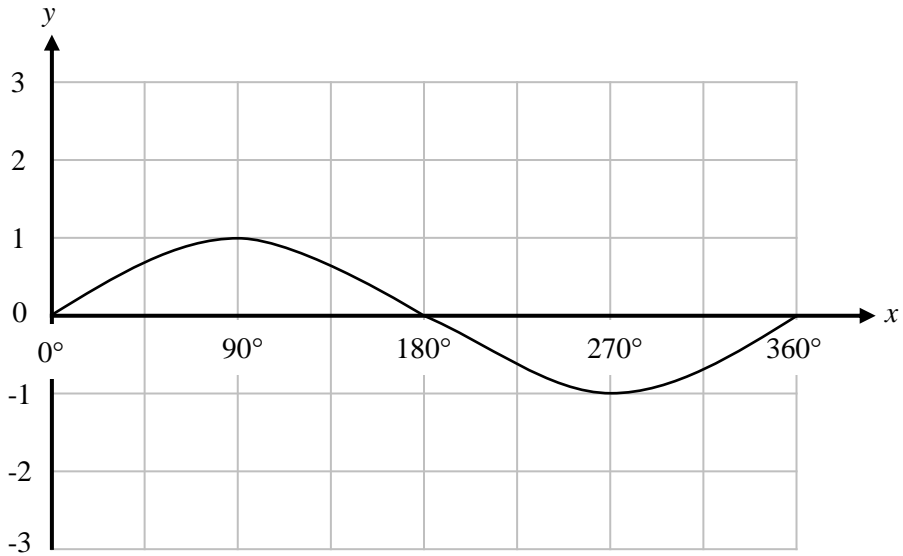
(b) Write down an equation of graph  $C$ .

..... (2)

(Total for Question 7 is 3 marks)

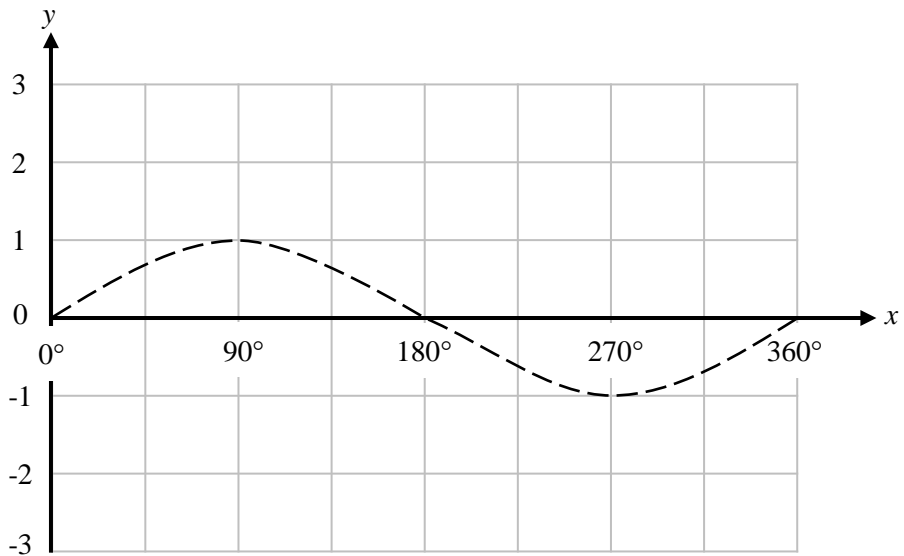


8 Here is the graph of  $y = \sin x^\circ$  for  $0^\circ \leq x \leq 360^\circ$



In parts (a), (b) and (c) the graph of  $y = \sin x^\circ$  is shown as a dashed line.

(a) On the grid below sketch the graph of  $y = \sin x^\circ - 2$  for  $0^\circ \leq x \leq 360^\circ$

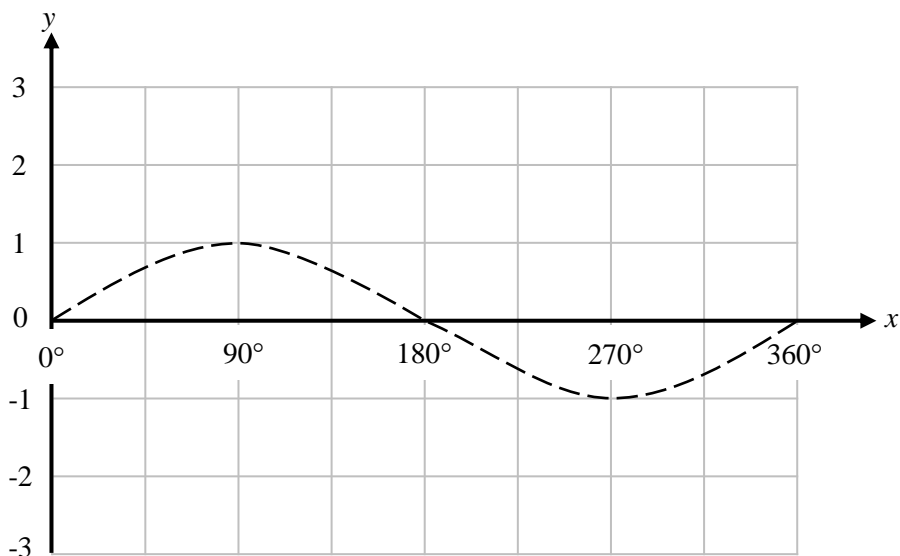


(1)



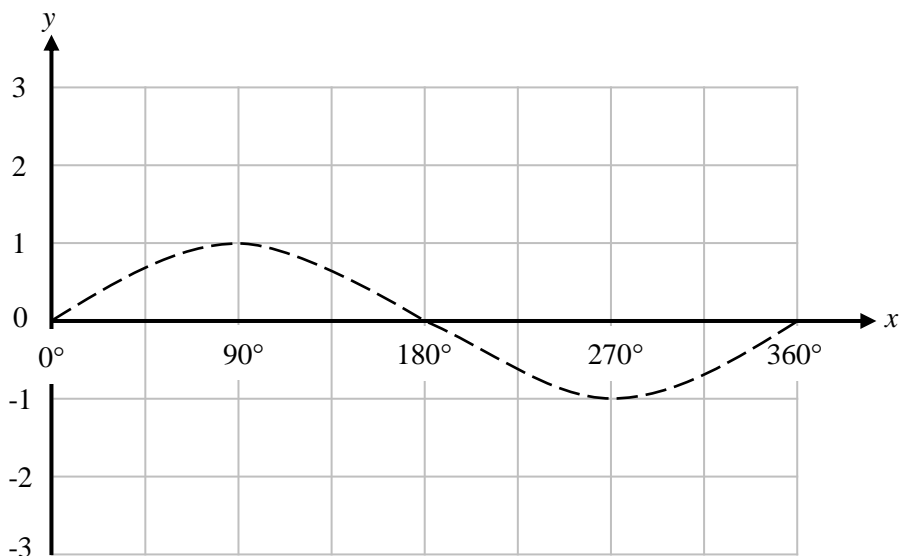


(b) On the grid below sketch the graph of  $y = \sin(x + 90^\circ)$  for  $0^\circ \leq x \leq 360^\circ$



(1)

(c) On the grid below sketch the graph of  $y = -\sin x^\circ$  for  $0^\circ \leq x \leq 360^\circ$



(1)

(Total for Question 8 is 3 marks)



- 9 The graph of  $y = 3x^2 + 2x - 5$  is reflected in the  $x$ -axis.  
The reflected graph has equation  $y = f(x)$

Work out  $f(x)$ .

Give your answer in the form  $ax^2 + bx + c$  where  $a$ ,  $b$  and  $c$  are integers.

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(Total for Question 9 is 2 marks)

- 10 The graph of  $y = x^2 + 5$  is translated 3 units to the left.  
The translated graph has equation  $y = f(x)$

Work out  $f(x)$ .

Give your answer in the form  $x^2 + ax + b$  where  $a$  and  $b$  are integers.

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(Total for Question 10 is 3 marks)



11 The graph of  $y = 2x^2 - 5x + 3$  is reflected in the  $y$ -axis.  
The reflected graph has equation  $y = f(x)$

Work out  $f(x)$ .

Give your answer in the form  $ax^2 + bx + c$  where  $a$ ,  $b$  and  $c$  are integers.

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(Total for Question 11 is 2 marks)

12 The graph of  $y = x^3 - 5$  is translated 2 units to the right.  
The translated graph has equation  $y = f(x)$

Work out  $f(x)$ .

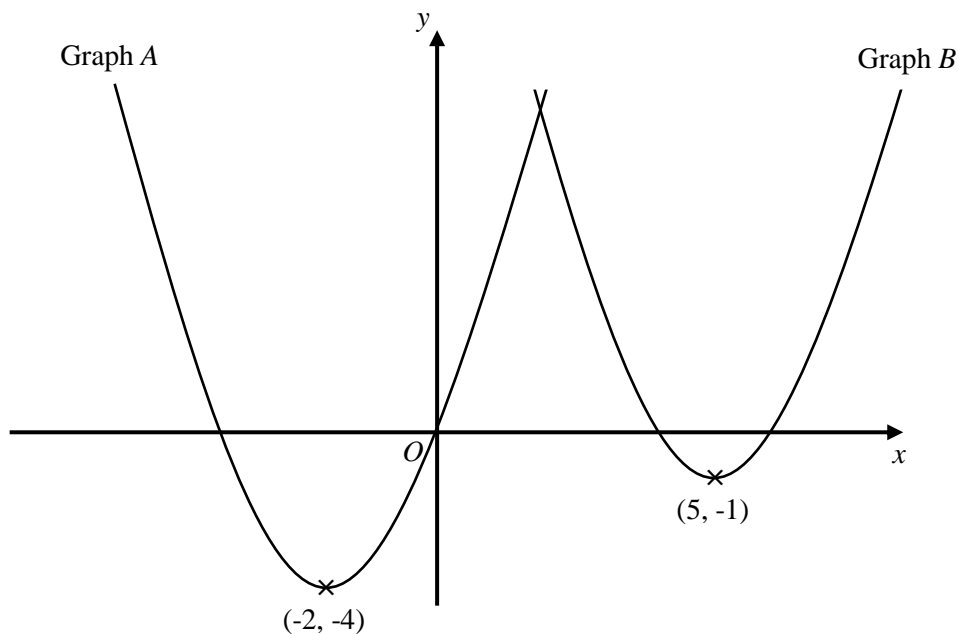
Give your answer in the form  $x^3 + ax^2 + bx + c$  where  $a$ ,  $b$  and  $c$  are integers.

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(Total for Question 12 is 4 marks)



13 Here are sketches of two graphs.



Graph A has equation  $y = x^2 + 4x$

Graph A is translated to give graph B so that the turning point  $(-2, -4)$  on graph A is mapped to the point  $(5, -1)$  on graph B.

Work out an equation for graph B.

Give your answer in the form  $x^2 + ax + b$  where  $a$  and  $b$  are integers.

.....  
(Total for Question 13 is 4 marks)



14 The graph of  $y = 10 - 2x^2$  is translated 3 units to the right and 1 unit up.  
The translated graph has equation  $y = f(x)$

Work out  $f(x)$ .

Give your answer in the form  $ax^2 + bx + c$  where  $a$ ,  $b$  and  $c$  are integers.

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(Total for Question 14 is 4 marks)

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