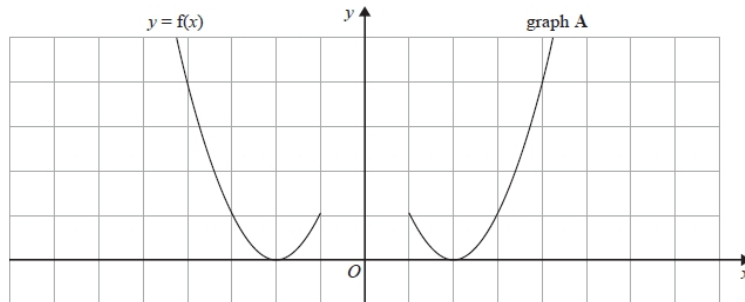


## A258 Transformation of functions

**Q1.**

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



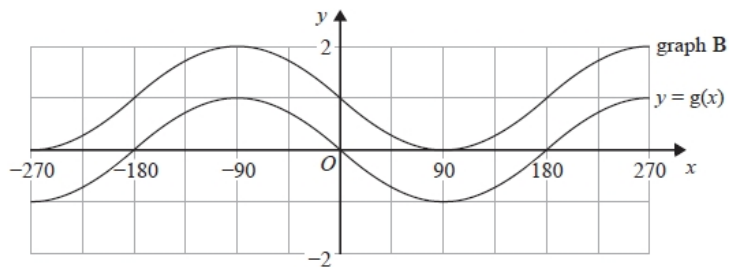
Graph **A** is a reflection of the graph of  $y = f(x)$ .

(a) Write down the equation of graph **A**.

.....

(1)

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



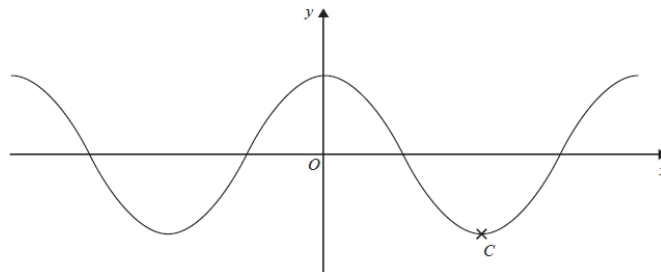
Graph **B** is a translation of  $y = g(x)$ .

(b) Write down the equation of graph **B**.

.....

(1)

The graph of  $y = \cos x^\circ$  is shown.



(c) Write down the coordinates of the point marked **C**.

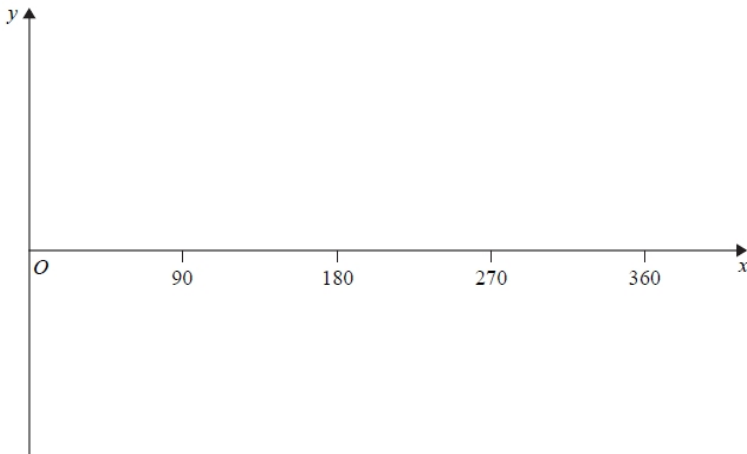
( ..... , ..... )

(1)

**(Total for question = 3 marks)**

**Q2.**

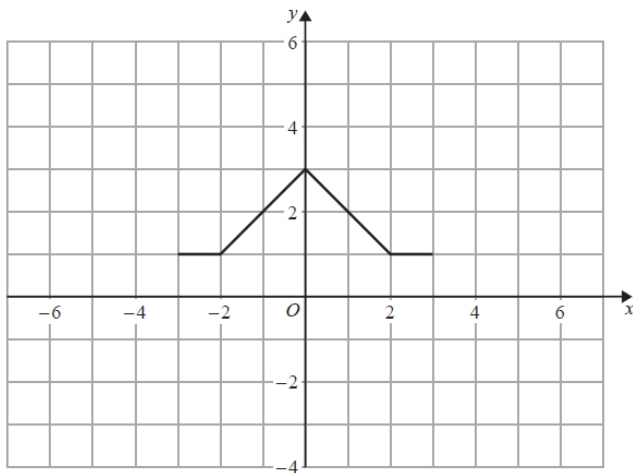
(a) Sketch the graph of  $y = \cos x^\circ$  for  $0 \leq x \leq 360$



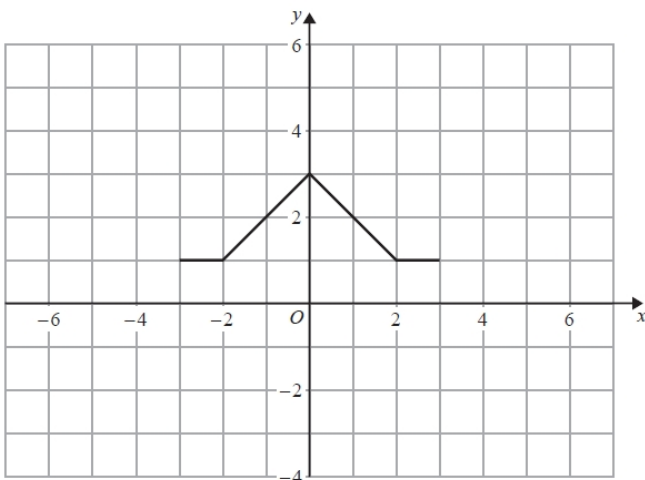
(2)

(b) The graph of  $y = f(x)$  is shown on both grids below.

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



(ii) On the grid below, draw the graph of  $y = f(x - 3)$

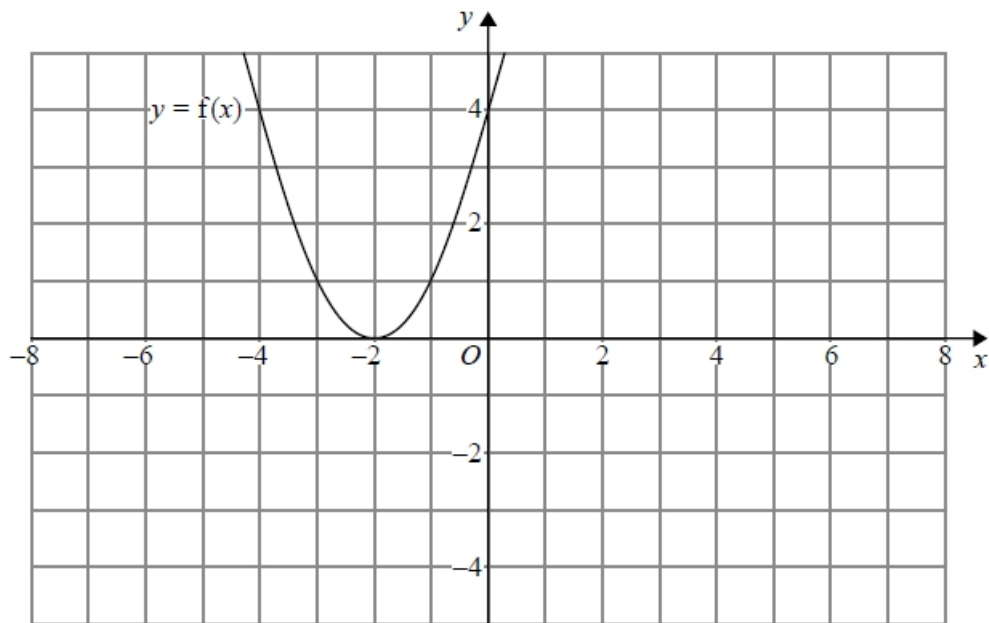


(2)

**(Total for question = 4 marks)**

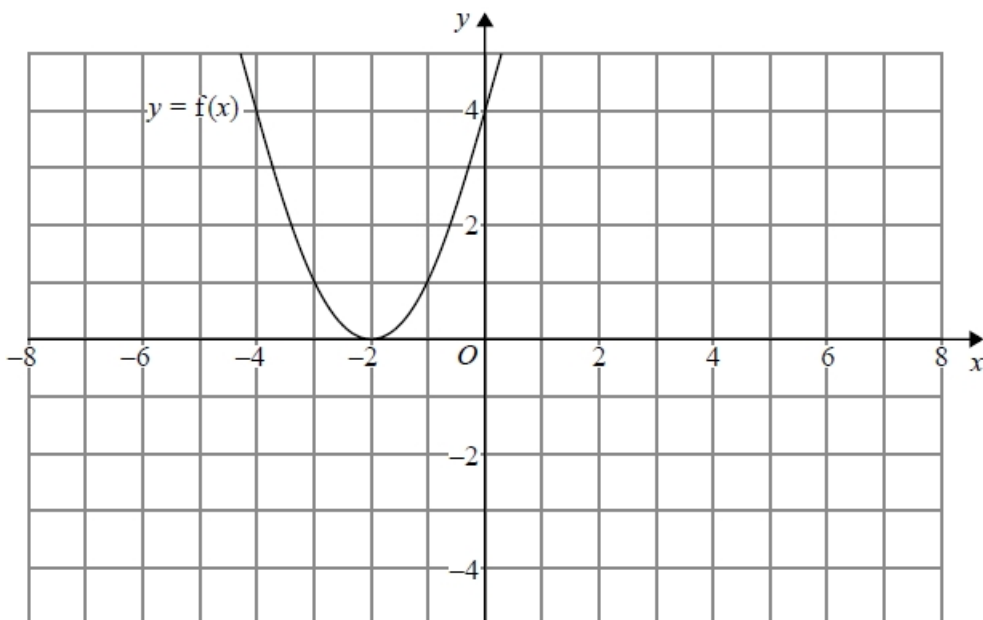
**Q3.**

The graph of  $y = f(x)$  is shown on both grids below.



(a) On the grid above, sketch the graph of  $y = f(-x)$

(1)



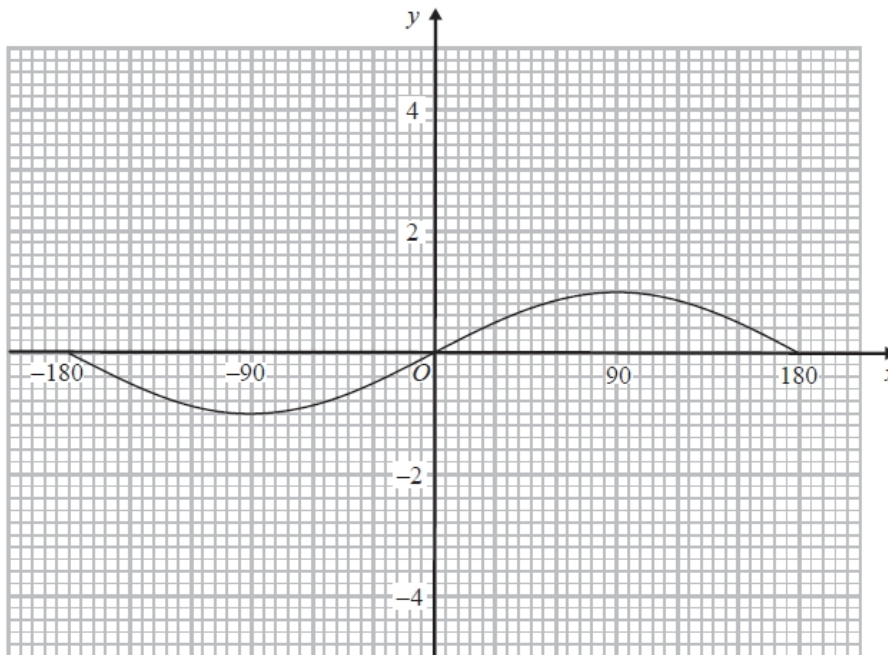
(b) On this grid, sketch the graph of  $y = -f(x) + 3$

(1)

**(Total for question = 2 marks)**

**Q4.**

Here is the graph of  $y = \sin x^\circ$  for  $-180 \leq x \leq 180$



On the grid, sketch the graph of  $y = \sin x^\circ - 2$  for  $-180 \leq x \leq 180$

**(Total for question = 2 marks)**

**Q5.**

The table shows some values of  $x$  and  $y$  that satisfy the equation  $y = a \cos x^\circ + b$

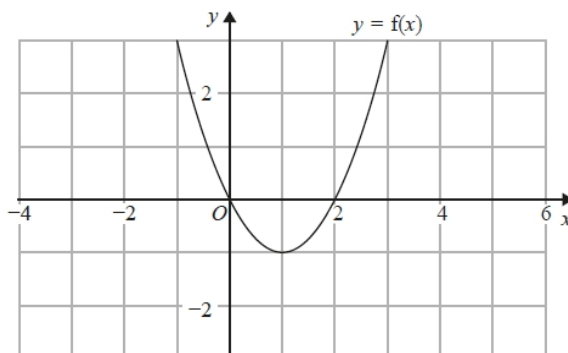
|     |   |                |    |    |     |                |     |
|-----|---|----------------|----|----|-----|----------------|-----|
| $x$ | 0 | 30             | 60 | 90 | 120 | 150            | 180 |
| $y$ | 3 | $1 + \sqrt{3}$ | 2  | 1  | 0   | $1 - \sqrt{3}$ | -1  |

Find the value of  $y$  when  $x = 45$

.....  
**(Total for question = 4 marks)**

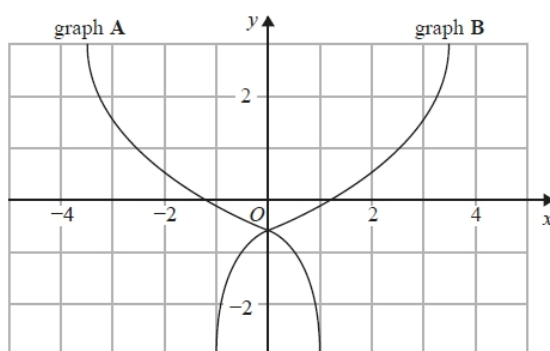
**Q6.**

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



(a) On the grid above, sketch the graph of  $y = f(x - 2)$

(1)



On the grid, graph **A** has been reflected to give graph **B**.

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

(b) Write down the equation of graph **B**.

.....

(1)

**(Total for question = 2 marks)**

**Q7.**

The graph of the curve C with equation  $y = f(x)$  is transformed to give the graph of the curve S with equation  $y = f(-x) - 3$

The point on C with coordinates (7, 2) is mapped to the point Q on S.

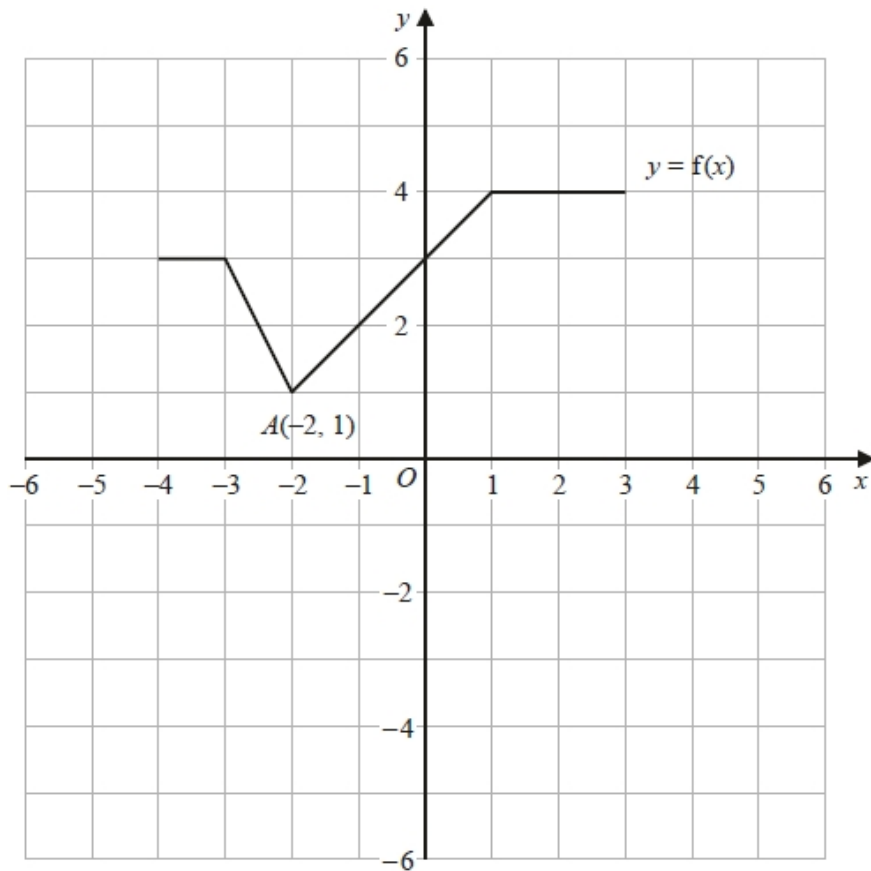
Find the coordinates of Q.

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

**(Total for question = 2 marks)**

**Q8.**

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



(a) On the grid, draw the graph with equation  $y = f(x + 1) - 3$

(2)

Point  $A(-2, 1)$  lies on the graph of  $y = f(x)$ .

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

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

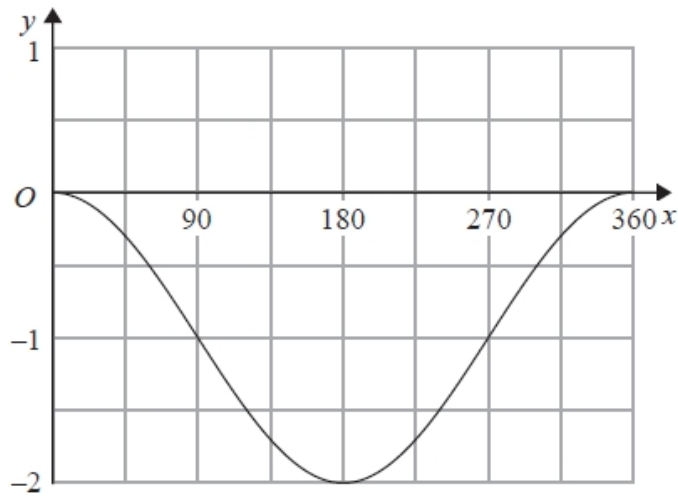
( ..... , ..... )

(1)

**(Total for question = 3 marks)**

**Q9.**

Here is a sketch of the curve  $y = \sin(x + a)^\circ + b$



Given that  $0 < a < 360$   
find the value of  $a$  and the value of  $b$ .

$a = \dots\dots\dots$

$b = \dots\dots\dots$

**(Total for question = 2 marks)**

**Q10.**

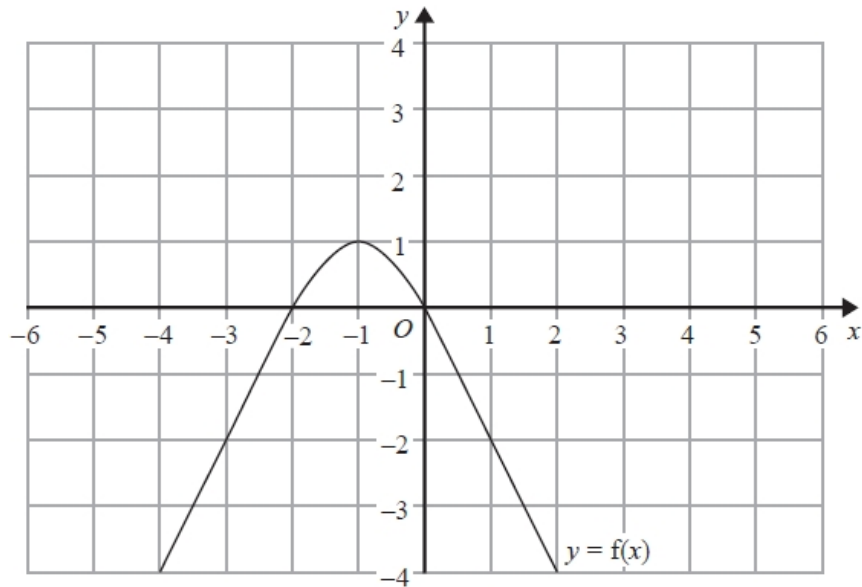
The graph of  $y = f(x)$  is transformed to give the graph of  $y = -f(x + 3)$   
The point  $A$  on the graph of  $y = f(x)$  is mapped to the point  $P$  on the graph of  $y = -f(x + 3)$   
The coordinates of point  $A$  are  $(9, 1)$   
Find the coordinates of point  $P$ .

$(\dots\dots\dots, \dots\dots\dots)$

**(Total for question is 2 marks)**

**Q11.**

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



(a) On the grid, sketch the graph of  $y = f(x - 1)$

(1)

The graph of  $y = f(x)$  has a turning point at the point  $(-1, 1)$

(b) Write down the coordinates of the turning point of the graph of  $y = f(-x) + 2$

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

(1)

**(Total for question = 2 marks)**