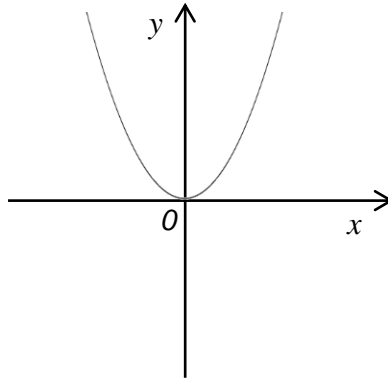


# Topic Test 1 (20 minutes)

## Transforming functions - Higher

- 1 This is the graph of  $y = x^2$

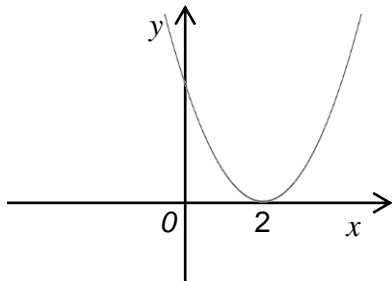


These graphs show transformations of  $y = x^2$

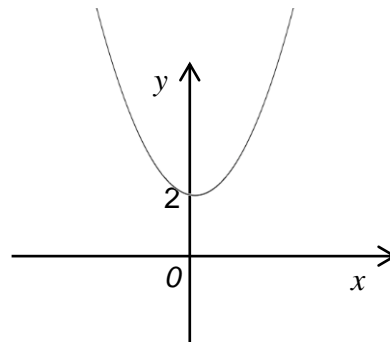
Match each graph with one of the equations on the following page.

[2 marks]

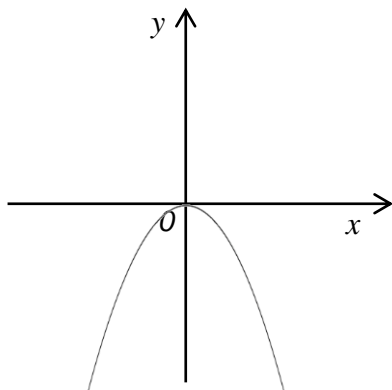
**Graph A**



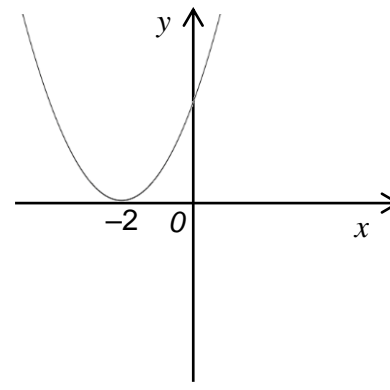
**Graph B**



**Graph C**



**Graph D**



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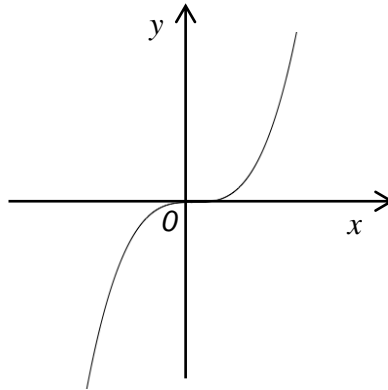
Graph \_\_\_\_\_ matches  $y = (x - 2)^2$

Graph \_\_\_\_\_ matches  $y = x^2 + 2$

Graph \_\_\_\_\_ matches  $y = (x + 2)^2$

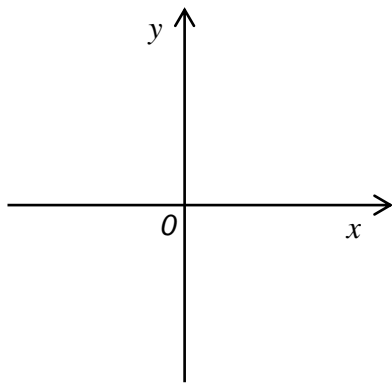
Graph \_\_\_\_\_ matches  $y = -x^2$

2 Here is a sketch of  $y = x^3$

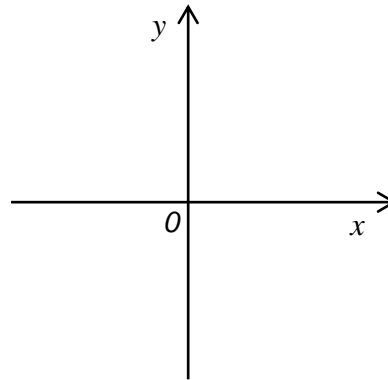


Sketch the graphs given by the following equations.

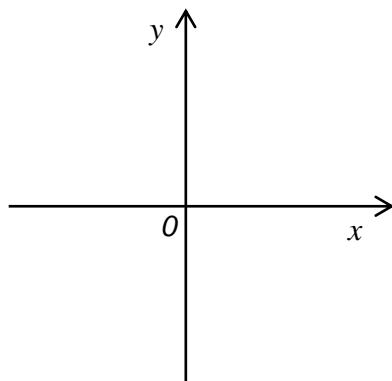
[4 marks]



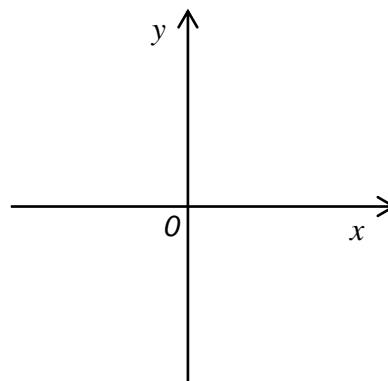
2 (a)  $y = -x^3$



2 (b)  $y = x^3 - 5$



2 (c)  $y = 2x^3$



2 (d)  $y = (x - 2)^3$

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**3 (a)** The graph of  $y = x^2$  is transformed by the vector  $\begin{pmatrix} 0 \\ -4 \end{pmatrix}$

Write down the equation of the transformed graph.

**[1 mark]**

Answer \_\_\_\_\_

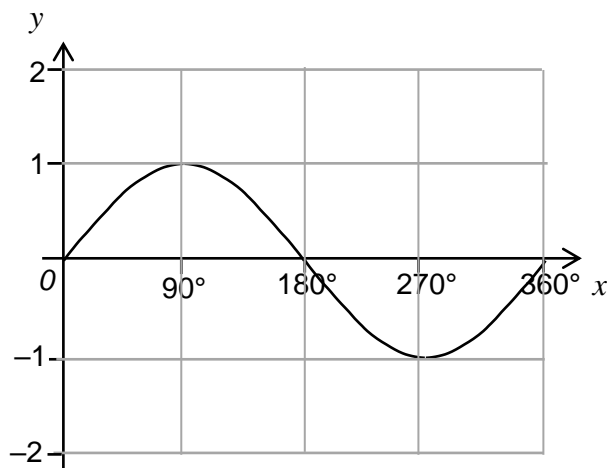
**3 (b)** The graph of  $y = x^2$  is transformed by the vector  $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$

Write down the equation of the transformed graph.

**[1 mark]**

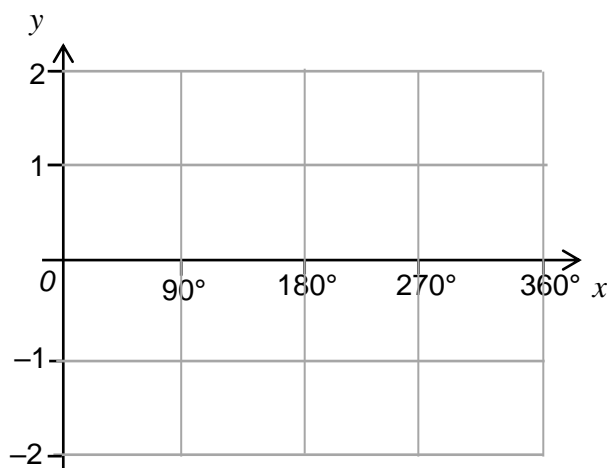
Answer \_\_\_\_\_

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

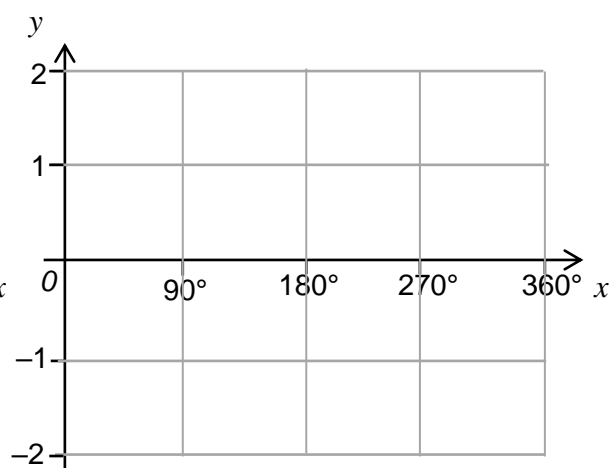


On the axes below draw the graphs of the given equations for  $0 \leq x \leq 360^\circ$

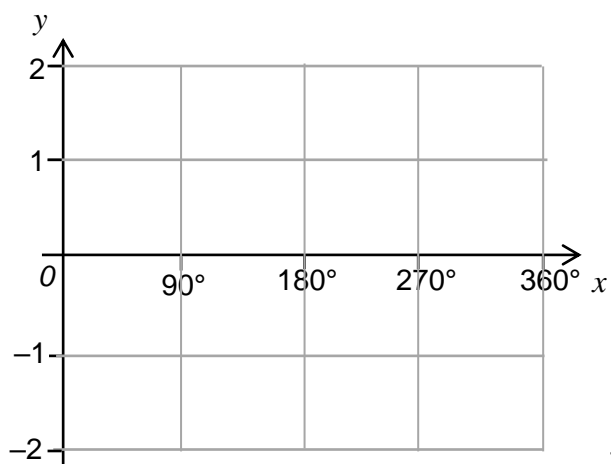
[4 marks]



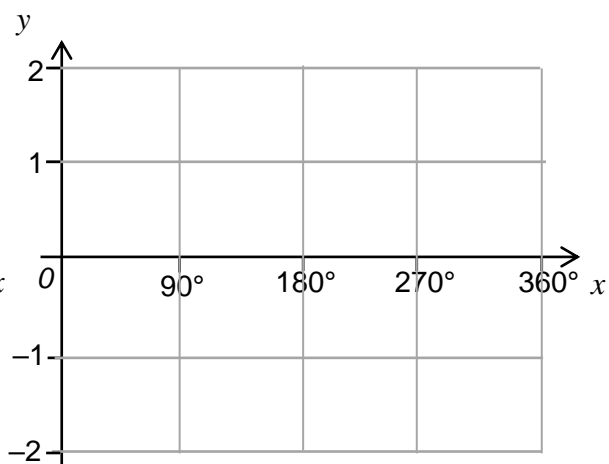
4 (a)  $y = -\sin x$



4 (b)  $y = \sin x + 1$

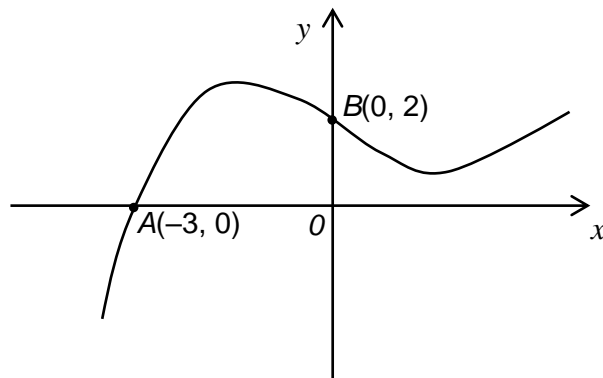


4 (c)  $y = \sin(x + 90)$



4 (d)  $y = \sin(x - 180)$

- 5 The graph of function  $y = f(x)$  passes through the points  $A(-3, 0)$  and  $B(0, 2)$ .



- 5 (a) The function  $y = f(x)$  is transformed to  $y = f(x) + 2$   
 $A$  and  $B$  are transformed to  $A'$  and  $B'$  by the transformation.

Write down the coordinates of  $A'$  and  $B'$

[2 marks]

Answer  $A' = ( \quad , \quad )$

Answer  $B' = ( \quad , \quad )$

- 5 (b) The function  $y = f(x)$  is transformed to  $y = f(x - 3)$   
 $A$  and  $B$  are transformed to  $A''$  and  $B''$  by the transformation.

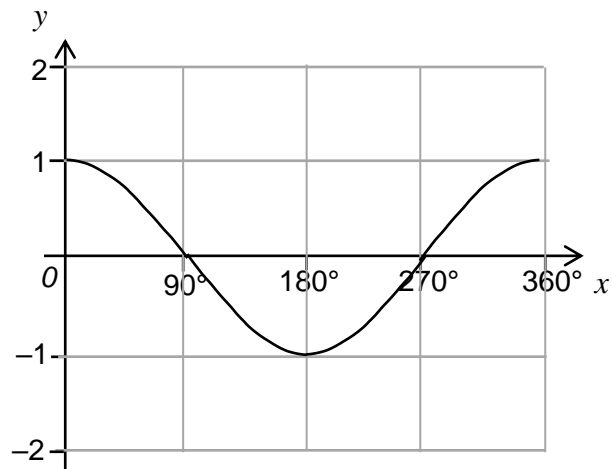
Write down the coordinates of  $A''$  and  $B''$

[2 marks]

Answer  $A'' = ( \quad , \quad )$

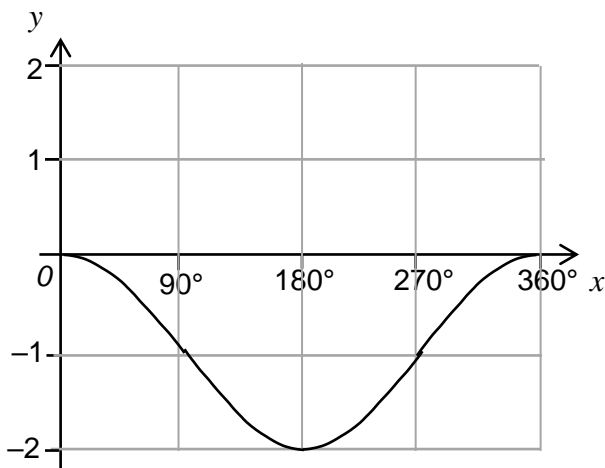
Answer  $B'' = ( \quad , \quad )$

6 This is the graph of  $y = \cos x$  for  $0 \leq x \leq 360^\circ$

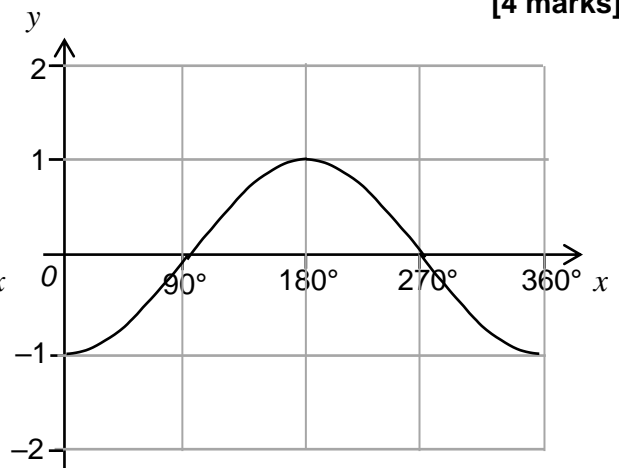


Work out the equations of the following graphs as a function involving cosine.

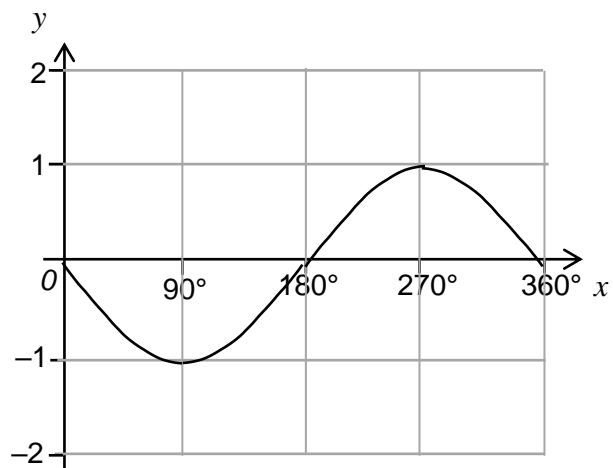
[4 marks]



6 (a)  $y =$  \_\_\_\_\_



6 (b)  $y =$  \_\_\_\_\_



6 (c)  $y =$  \_\_\_\_\_

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7 Circle **two** of the following for which  $f(x) = f(-x)$  is true.

[1 mark]

$$f(x) = x^2$$

$$f(x) = x^3$$

$$f(x) = \sin x$$

$$f(x) = \cos x$$