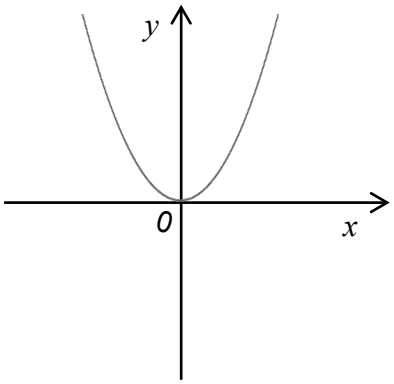
Topic Test 1 (20 minutes)

Transforming functions - Higher

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

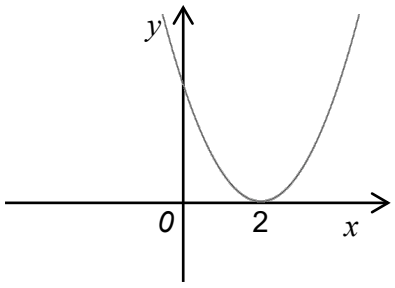


These graphs show transformations of $y = x^2$

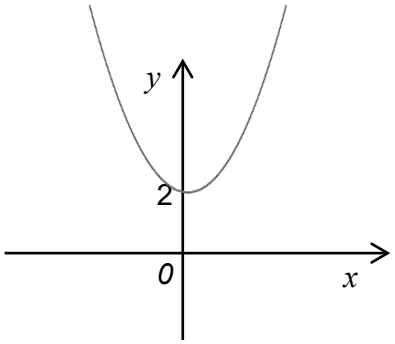
Match each graph with one of the equations on the following page.

[2 marks]

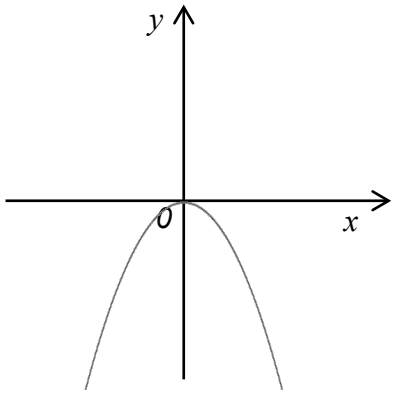
Graph A



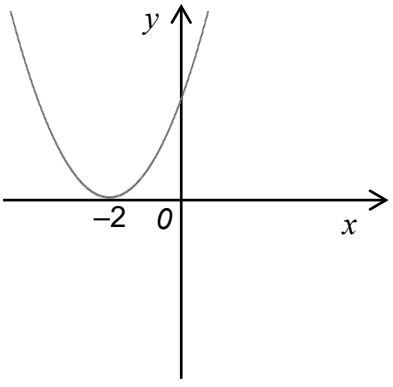
Graph B



Graph C



Graph D



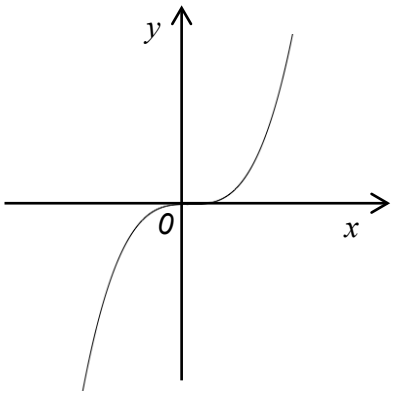
Graph _____ matches $y = (x - 2)^2$

Graph _____ matches $y = x^2 + 2$

Graph _____ matches $y = (x + 2)^2$

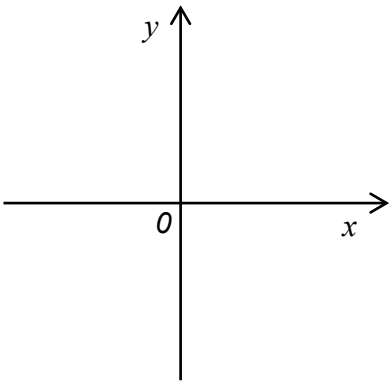
Graph _____ matches $y = -x^2$

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

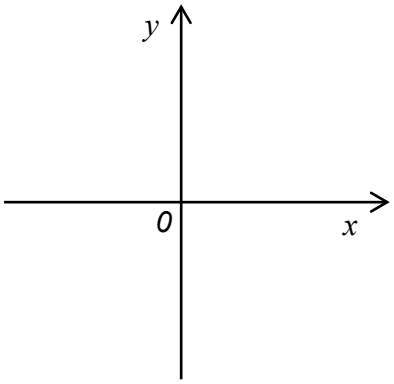


Sketch the graphs given by the following equations.

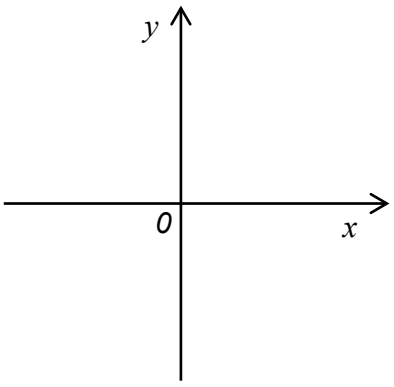
[4 marks]



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



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



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

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 _____

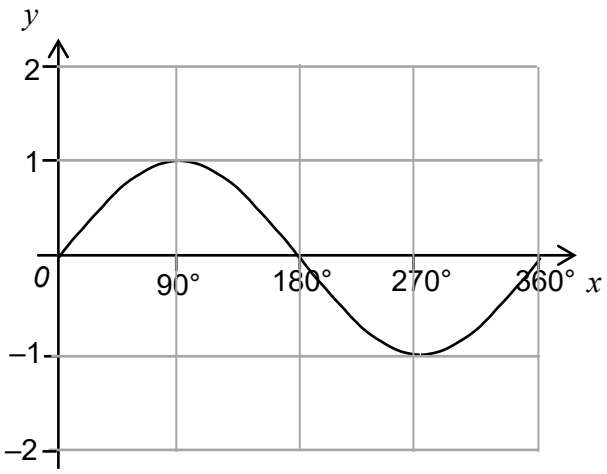
3 (b) The graph of $y = x^2$ is transformed by the vector $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$

Write down the equation of the transformed graph.

[1 mark]

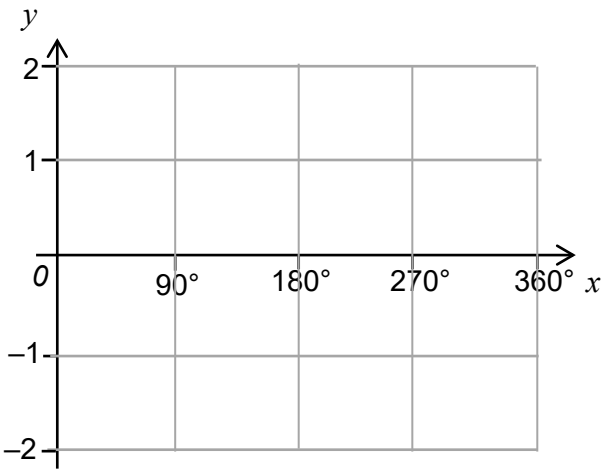
Answer _____

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

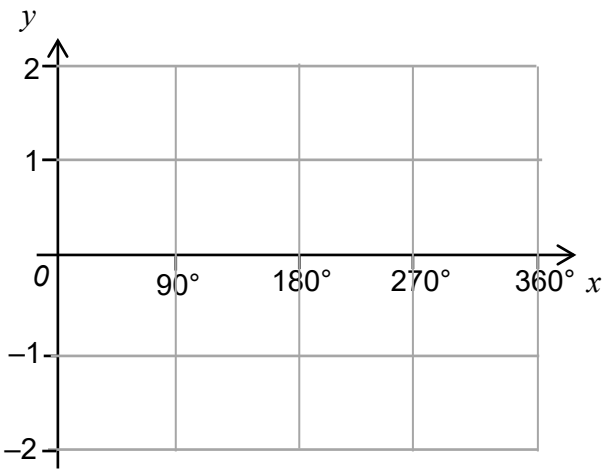


On the axes below draw the graphs of the given equations for $0 \leq x \leq 360°$

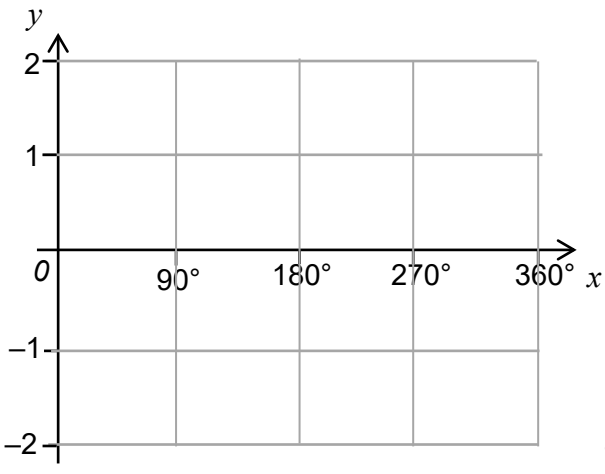
[4 marks]



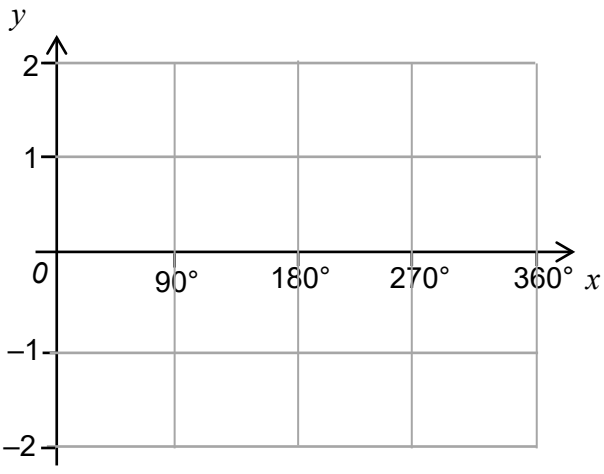
4 (a) $y = -\sin x$



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

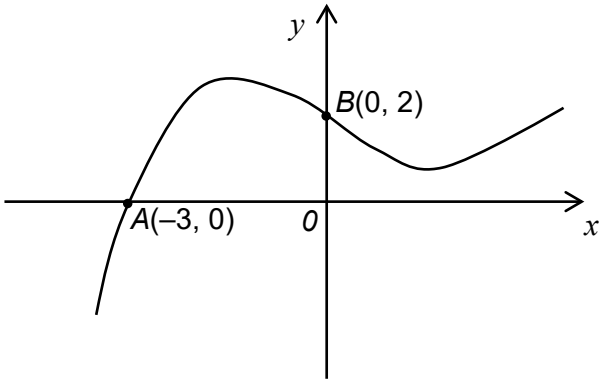


4 (c) $y = \sin (x + 90)$



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' = (_____ , _____)

Answer B' = (_____ , _____)

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.

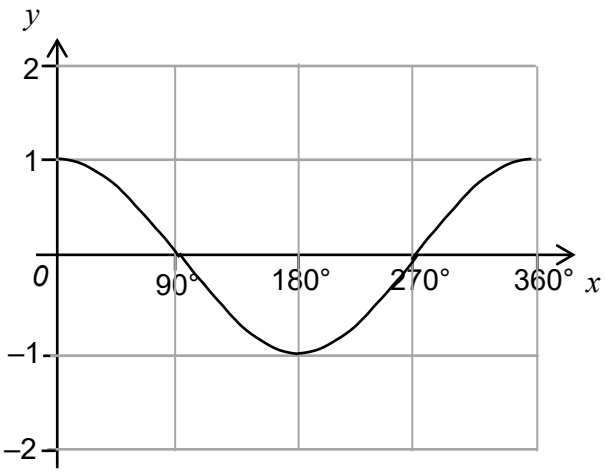
Write down the coordinates of A'' and B''

[2 marks]

Answer A'' = (_____ , _____)

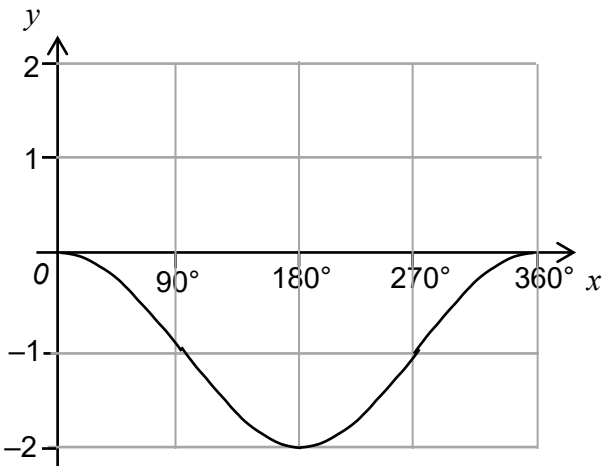
Answer B'' = (_____ , _____)

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

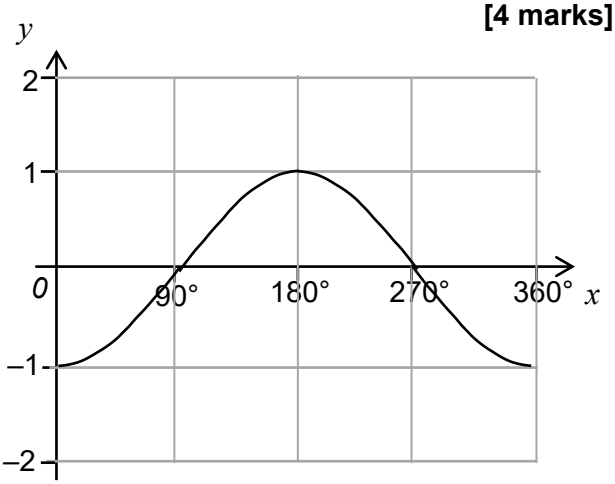


Work out the equations of the following graphs as a function involving cosine.

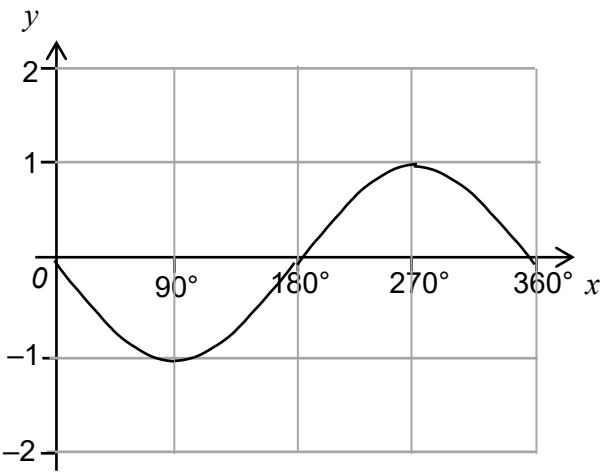
[4 marks]



6 (a) $y =$ _____



6 (b) $y =$ _____



6 (c) $y =$ _____

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