

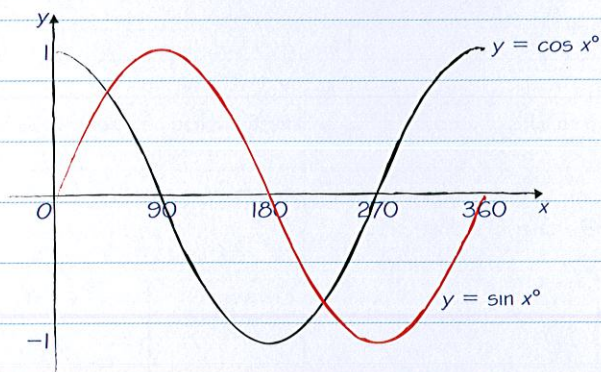
A*
A
B
C
D

Transformations 2

You need to be able to convert between FUNCTION NOTATION and equations of graphs. This table shows some transformations that may come up in your exam.

Original function	$y = 2x + 3$	$y = \sin x^\circ$	$y = x^2 - 2x + 1$	$y = x^2$
Transformation	$f(x) \rightarrow f(x) + 2$	$f(x) \rightarrow f(x - 30)$	$f(x) \rightarrow 2f(x)$	$f(x) \rightarrow f(3x)$
Which means...	movement UP by 2 units	movement RIGHT by 30°	stretch in vertical direction, scale factor 2	stretch in horizontal direction, scale factor $\frac{1}{3}$
New function	$y = 2x + 5$	$y = \sin(x - 30)^\circ$	$y = 2x^2 - 4x + 2$	$y = 9x^2$

Graphs of sine and cosine

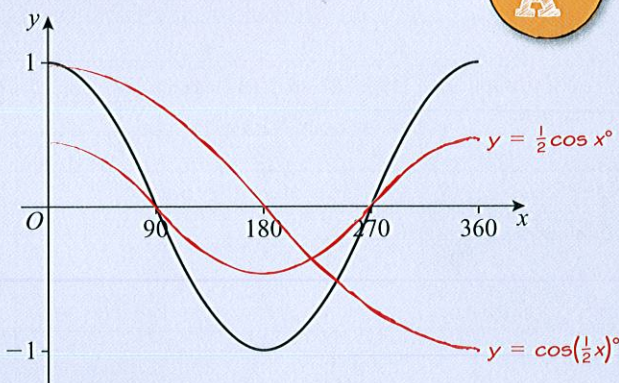


The graph of $y = \cos x^\circ$ is identical to the graph of $y = \sin x^\circ$ except that it has been moved to the left by 90° .

- Write down the transformations using function notation.
- (a) Stretch in the vertical direction with scale factor $\frac{1}{2}$.
 - (b) Stretch in the horizontal direction with scale factor 2.

Worked example

grade A*

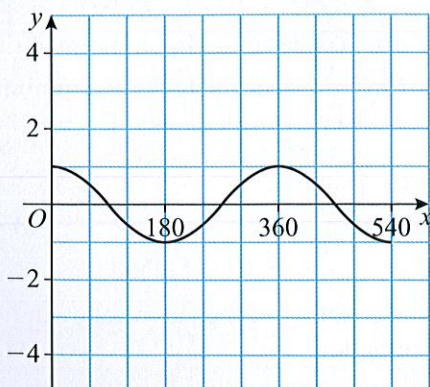


The diagram shows a sketch of the curve $y = \cos x^\circ$ for $0 \leq x \leq 360$

On the same diagram sketch the curve with equation

- (a) $y = \frac{1}{2} \cos x^\circ$ $y = \frac{1}{2}f(x)$
- (b) $y = \cos\left(\frac{1}{2}x\right)^\circ$ $y = f\left(\frac{1}{2}x\right)$

Now try this



The grid shows the graph of $y = \cos x^\circ$ for values of x from 0 to 540

On the grid, sketch the graph of $y = 3 \cos(2x)^\circ$ for values of x from 0 to 540 (2 marks)

grade A*