The effect of transformations on specific points

Sometimes you will not be given the original function, but will be given a sketch with specific points and features you need to transform.

Where would each of these points end up?

$y = f(x)$	$(4, 3)$	$(1, 0)$	$(6, -4)$
$y = f(x + 1)$			
$y = f(2x)$			
$y = 3f(x)$			
$y = f(x) - 1$			
$y = f\left(\frac{x}{4}\right)$			
$y = f(-x)$			
$y = -f(x)$			

Test Your Understanding

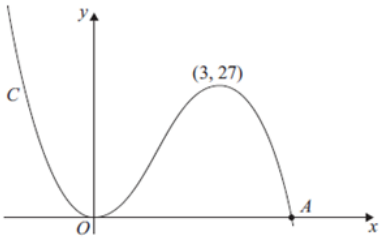

Figure 1 shows a sketch of the curve C with equation $y = f(x)$, where

$$f(x) = x^2(9 - 2x).$$

There is a minimum at the origin, a maximum at the point (3, 27) and C cuts the x-axis at the point A.

(a) Write down the coordinates of the point A.

(1)

(b) On separate diagrams sketch the curve with equation

(i) $y = f(x + 3)$,

(ii) $y = f(3x)$.

On each sketch you should indicate clearly the coordinates of the maximum point and any points where the curves cross or meet the coordinate axes.

(6)

The curve with equation $y = f(x) + k$, where k is a constant, has a maximum point at (3, 10).

(c) Write down the value of k.

(1)

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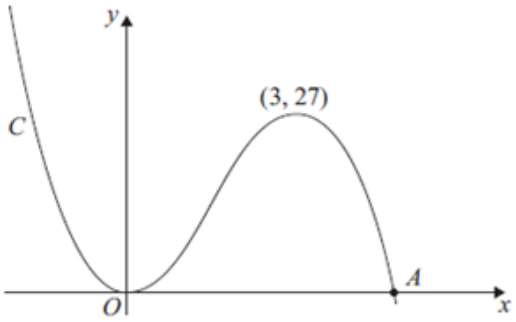
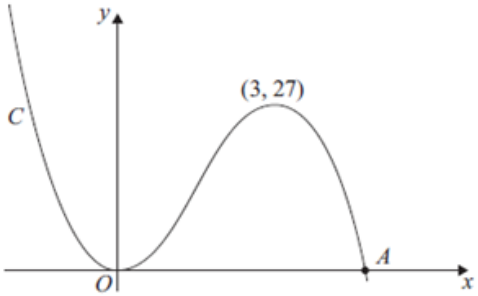
a)

b)





c)