Higher Mathematics

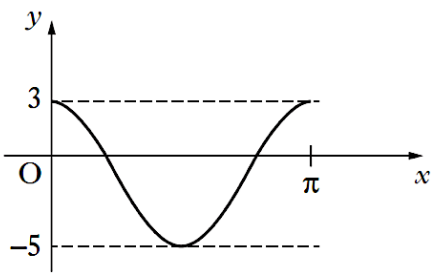
Graph Transformations - **Questions** - 2013-2019

Marks are indicated in brackets after each question number

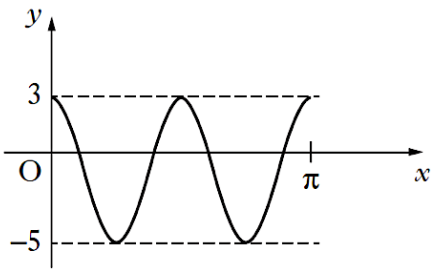
2013 Paper 1 Question 4, (2)

Which of the following shows the graph of $y = 4\cos 2x - 1$, for $0 \leq x \leq \pi$?

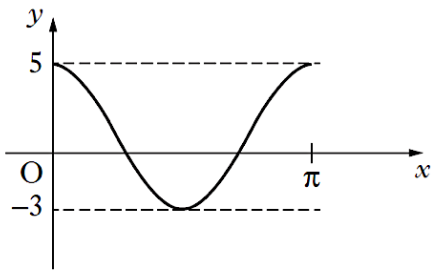
A



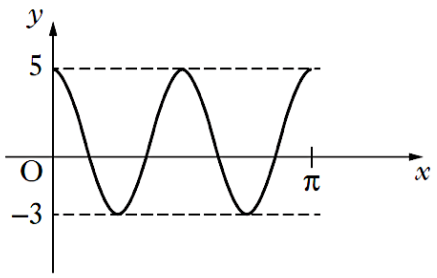
B



C

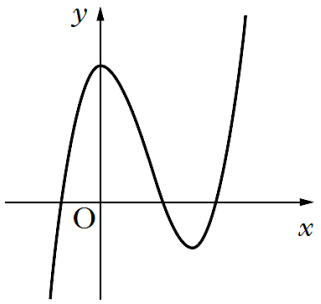


D



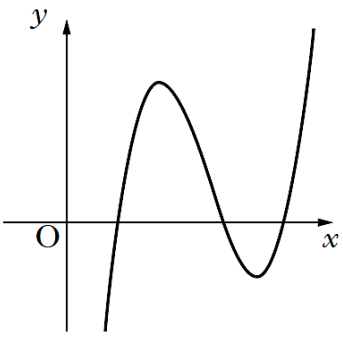
2013 Paper 1 Question 11, (2)

The diagram shows a cubic curve with equation $y = f(x)$.

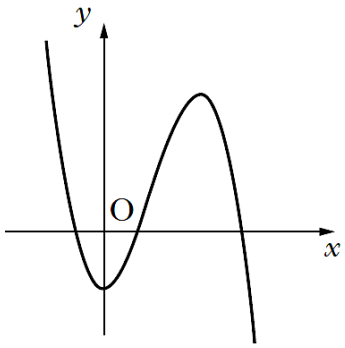


Which of the following diagrams could show the curve with equation $y = -f(x - k)$, $k > 0$?

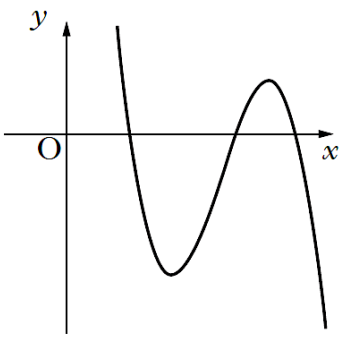
A



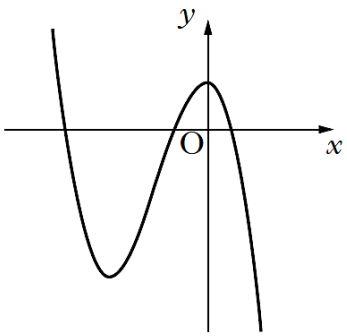
C



B

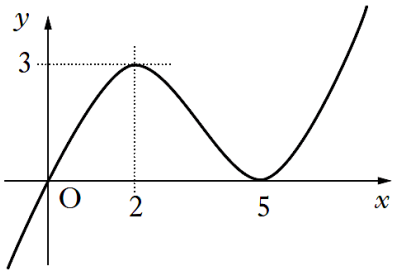


D



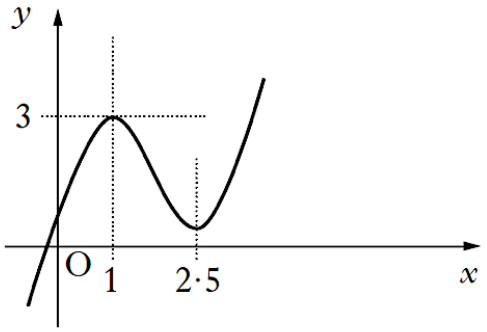
2014 Paper 1 Question 11, (2)

The diagram shows part of the graph of $y = f(x)$.

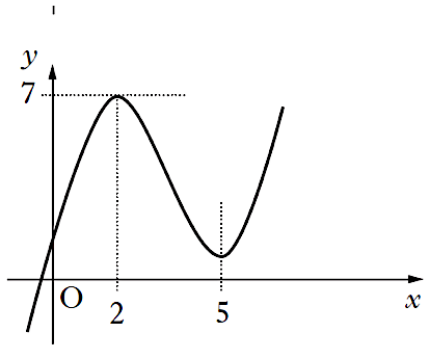


Which of the following diagrams could be the graph of $y = 2f(x) + 1$?

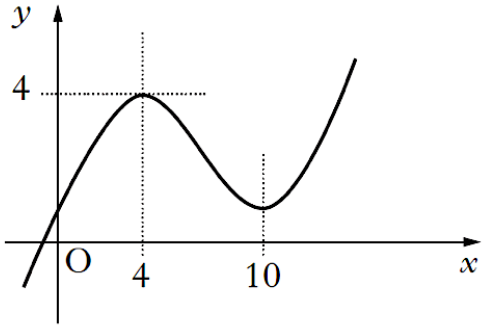
A



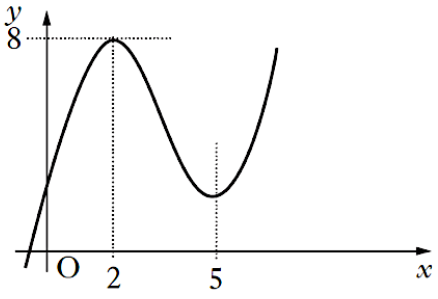
C



B

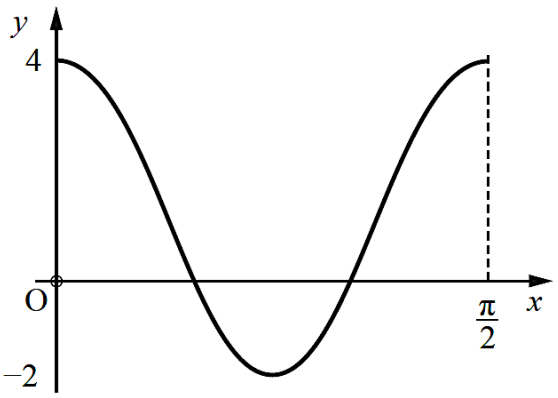


D



2015 Paper 1 Question 4, (3)

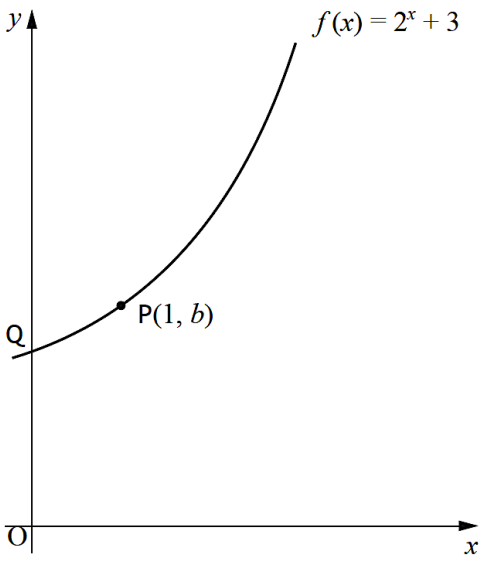
The diagram shows part of the graph of the function $y = p\cos qx + r$.



Write down the values of p, q and r.

2015 Paper 1 Question 13, (1) (1) (3) (2)

The graph with equation $y = f(x)$ passes through the point P$(1, b)$ and cuts the y-axis at Q as shown in the diagram.



(a) What is the value of b?

(b) (i) Copy the above diagram.

On the same diagram, sketch the graph with equation $y = f^{-1}(x)$.

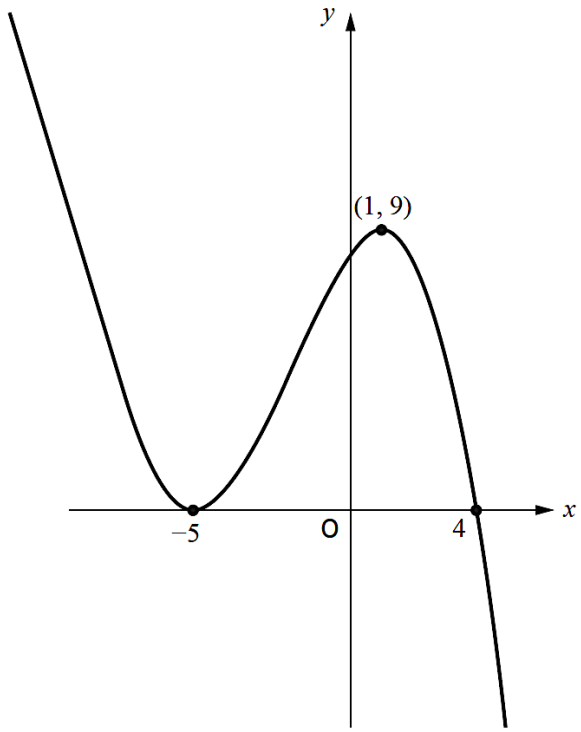
(ii) Write down the coordinates of the images of P and Q.

(c) R $(3,11)$ also lies on the graph with equation $y = f(x)$.

Find the coordinates of the image of R on the graph with equation $y = 4 - f(x + 1)$.

2016 Paper 1 Question 15, (3) (1)

The diagram below shows the graph with equation $y = f(x)$, where $f(x) = k(x-a)(x-b)^2$.



(a) Find the values of a, b and k.

(b) For the function $g(x) = f(x) - d$, where d is positive, determine the range of values of d for which $g(x)$ has exactly one real root.

2017 Paper 1 Question 15, (2)

A quadratic function, f, is defined on $\mathbb{R}$, the set of real numbers.

Diagram 1 shows part of the graph with equation $y = f(x)$.
The turning point is $(2, 3)$.

Diagram 2 shows part of the graph with equation $y = h(x)$.
The turning point is $(7, 6)$.

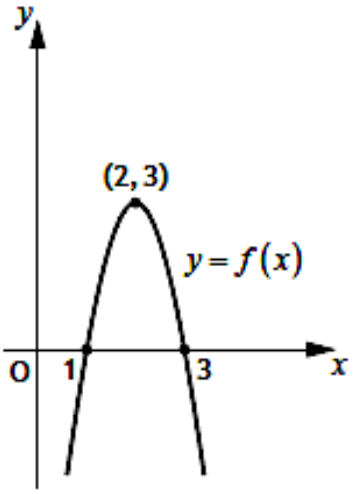


Diagram 1

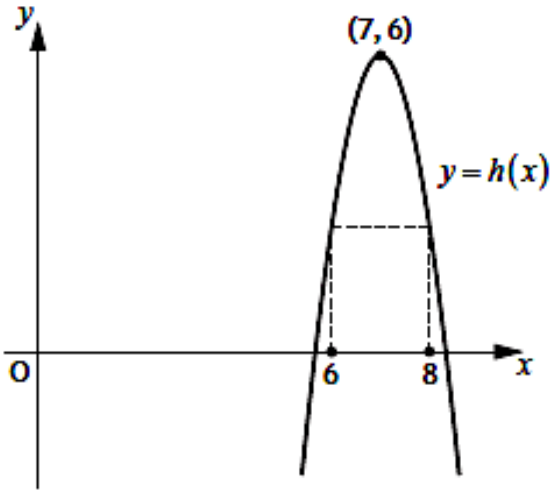


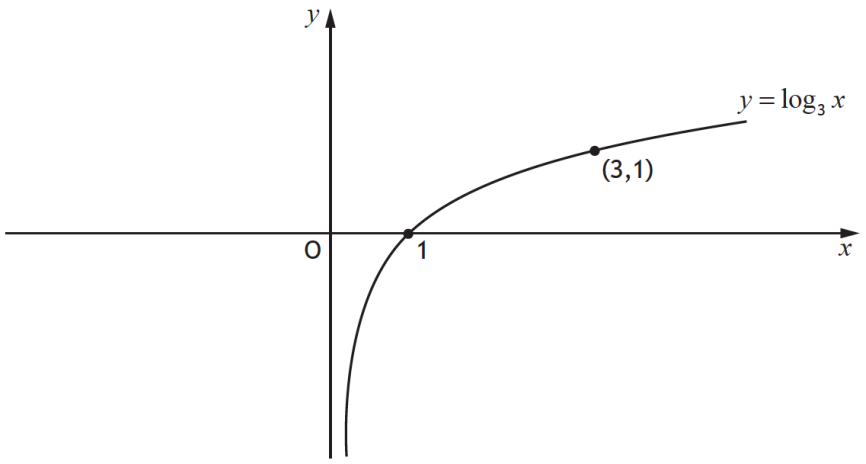
Diagram 2

(a) Given that $h(x) = f(x + a) + b$.

Write down the values of a and b.

2018 Paper 1 Question 11, (2) (3)

The diagram shows the curve with equation $y = \log_3 x$.

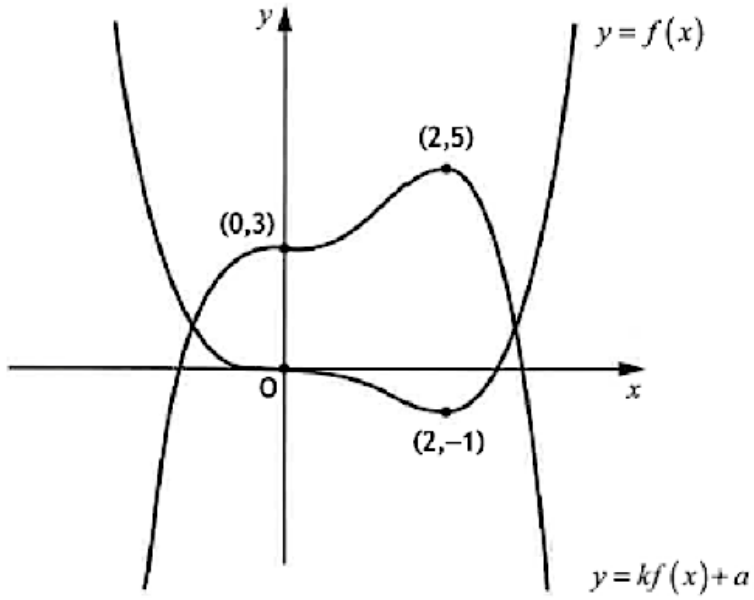


(a) On the diagram in your answer booklet, sketch the curve with equation $y = 1 - \log_3 x$.

(b) Determine the exact value of the x-coordinate of the point of intersection of the two curves.

2019 Paper 1 Question 10, (1) (1)

The diagram shows the graphs with equations $y = f(x)$ and $y = kf(x) + a$.



(a) State the value of a.

(b) Find the value of k.