Transformations of graphs Difficulty : Easy

Question Paper 1

Level	AS & A Level
Subject	Maths - Pure
Exam Board	Edexcel
Topic	Graphs and transformations
Sub-Topic	Transformations of graphs
Difficulty	Easy
Booklet	Question Paper 1

Time allowed: **49 minutes**

Score: **/41**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>76%	61%	52%	42%	33%	23%	<23%

On separate diagrams, sketch the graphs of

(a) $y = (x + 3)^2$, **(3)**

(b) $y = (x + 3)^2 + k$, where k is a positive constant.

Show on each sketch the coordinates of each point at which the graph meets the axes. **(2)**

(Total 5 marks)

Question 2

Figure 1

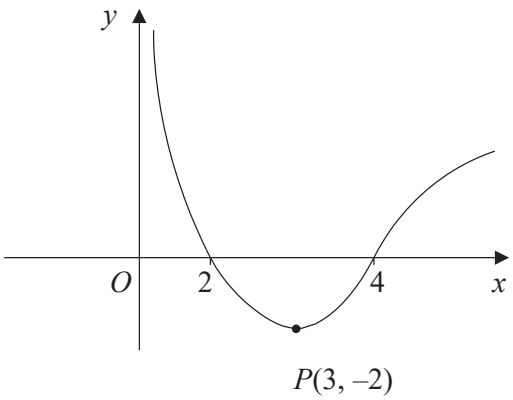

Figure 1 shows a sketch of the curve with equation $y = f(x)$. The curve crosses the x-axis at the points (2, 0) and (4, 0). The minimum point on the curve is $P(3, –2)$.

In separate diagrams sketch the curve with equation

(a) $y = –f(x)$, **(3)**

(b) $y = f(2x)$. **(3)**

On each diagram, give the coordinates of the points at which the curve crosses the x-axis, and the coordinates of the image of P under the given transformation.

(Total 6 marks)

Figure 1

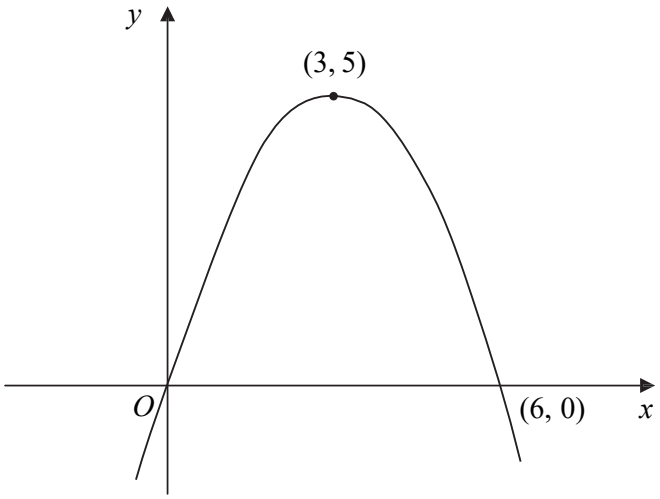

Figure 1 shows a sketch of the curve with equation $y = f(x)$. The curve passes through the origin O and through the point (6, 0). The maximum point on the curve is (3, 5).

On separate diagrams, sketch the curve with equation

(a) $y = 3f(x)$, **(2)**

(b) $y = f(x + 2)$. **(3)**

On each diagram, show clearly the coordinates of the maximum point and of each point at which the curve crosses the x-axis.

(Total 5 marks)

Figure 1

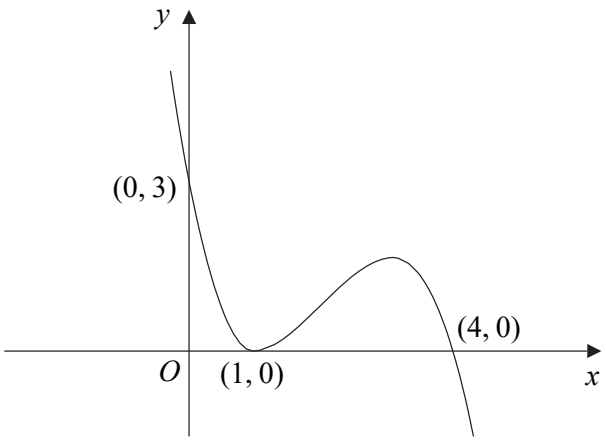

Figure 1 shows a sketch of the curve with equation $y = f(x)$. The curve passes through the points (0, 3) and (4, 0) and touches the x-axis at the point (1, 0).

On separate diagrams sketch the curve with equation

(a) $y = f(x + 1)$, **(3)**

(b) $y = 2\,f(x)$, **(3)**

(c) $y = f\left(\frac{1}{2}x\right)$. **(3)**

On each diagram show clearly the coordinates of all the points where the curve meets the axes.

(Total 9 marks)

Given that $f(x) = \frac{1}{x}, \quad x \neq 0,$

(a) sketch the graph of $y = f(x) + 3$ and state the equations of the asymptotes. **(4)**

(b) Find the coordinates of the point where $y = f(x) + 3$ crosses a coordinate axis. **(2)**

(Total 6 marks)

Question 6

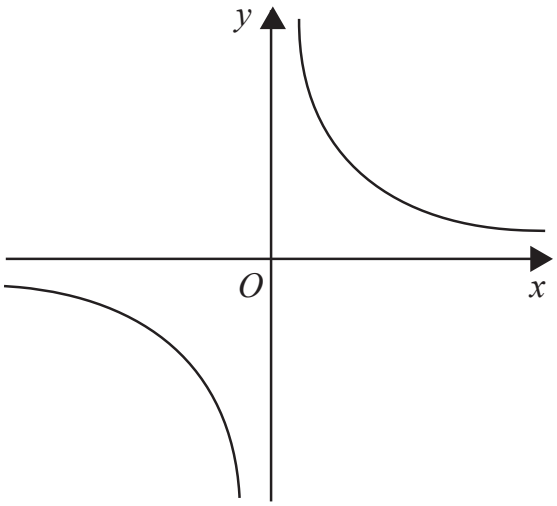

Figure 1

Figure 1 shows a sketch of the curve with equation $y = \frac{3}{x}, x \neq 0$.

(a) On a separate diagram, sketch the curve with equation $y = \frac{3}{x+2}, x \neq -2$,

showing the coordinates of any point at which the curve crosses a coordinate axis. **(3)**

(b) Write down the equations of the asymptotes of the curve in part (a). **(2)**

(Total 5 marks)

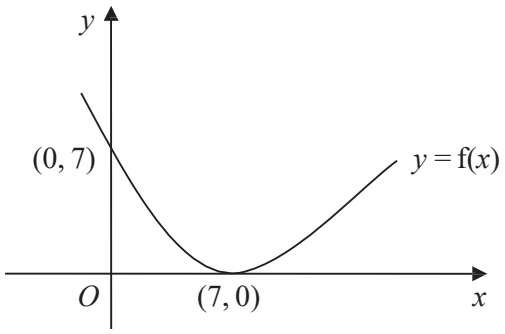

Figure 1

Figure 1 shows a sketch of the curve with equation $y = f(x)$. The curve passes through the point (0, 7) and has a minimum point at (7, 0).

On separate diagrams, sketch the curve with equation

(a) $y = f(x) + 3$, **(3)**

(b) $y = f(2x)$. **(2)**

On each diagram, show clearly the coordinates of the minimum point and the coordinates of the point at which the curve crosses the y-axis.

(Total 5 marks)