Transformations of Graphs 2 - Edexcel Past Exam Questions
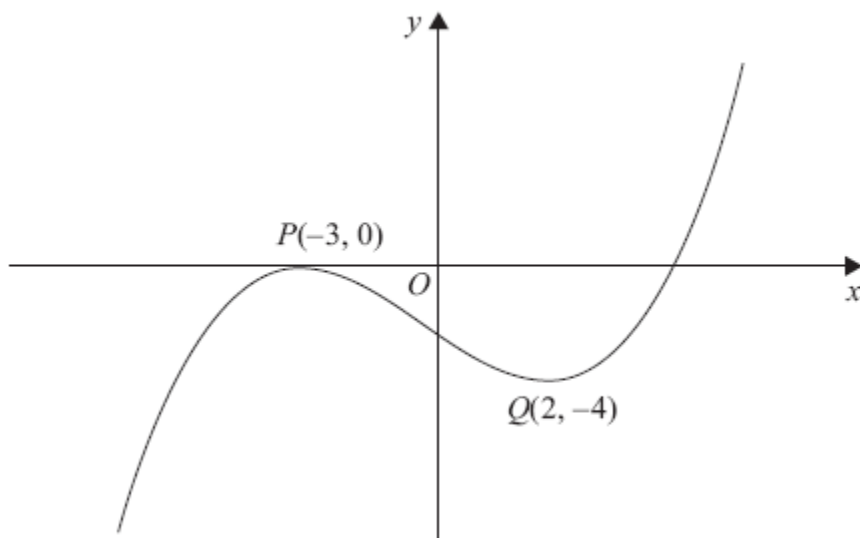
1.

Figure 1

Figure 1 shows the graph of equation $y = f(x)$.

The points $P(-3, 0)$ and $Q(2, -4)$ are stationary points on the graph.

Sketch, on separate diagrams, the graphs of

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

(b) $y = \left| f(x) \right|$. **(3)**

On each diagram, show the coordinates of any stationary points.
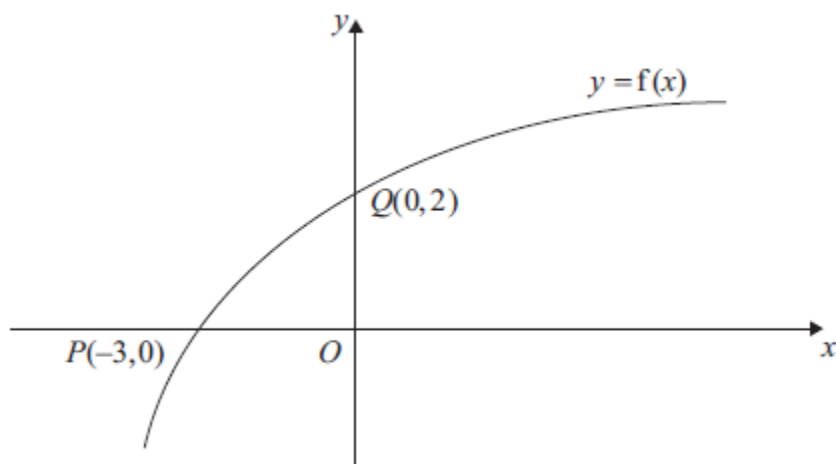
Jan 12 Q2

2.

Figure 1

Figure 1 shows part of the curve with equation $y = f(x)$, $x \in \mathbb{R}$.

The curve passes through the points $Q(0, 2)$ and $P(-3, 0)$ as shown.

(a) Find the value of ff (-3). **(2)**

On separate diagrams, sketch the curve with equation

(b) $y = f^{-1}(x)$, **(2)**

(c) $y = f(|x|) - 2$, **(2)**

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

Indicate clearly on each sketch the coordinates of the points at which the curve crosses or meets the axes.

Jan 13 Q3

3.   Given that

$$f(x) = \ln x, \qquad x > 0$$

sketch on separate axes the graphs of

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

(ii) $y = |f(x)|$,

(iii) $y = -f(x - 4)$.

Show, on each diagram, the point where the graph meets or crosses the x-axis.
In each case, state the equation of the asymptote.   **(7)**
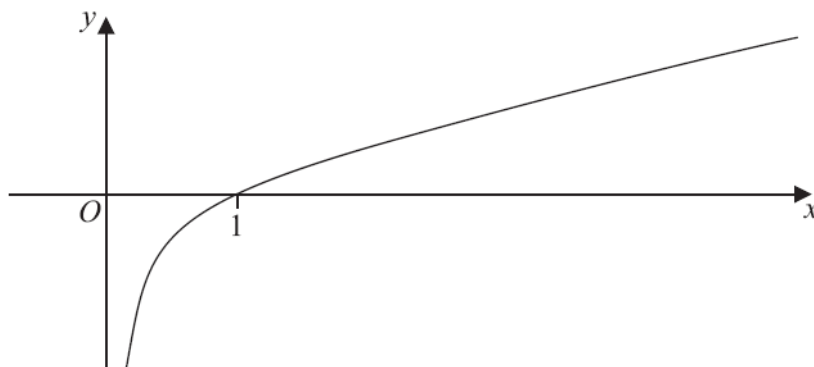
June 13 Q2

4.

Figure 1

Figure 1 shows a sketch of the curve with equation $y = f(x)$, $x > 0$, where f is an increasing function of x. The curve crosses the x-axis at the point $(1, 0)$ and the line $x = 0$ is an asymptote to the curve.

On separate diagrams, sketch the curve with equation

(*a*) $y = f(2x)$, $x > 0$ **(2)**

(*b*) $y = |f(x)|$, $x > 0$ **(3)**

Indicate clearly on each sketch the coordinates of the point at which the curve crosses or meets the x-axis.
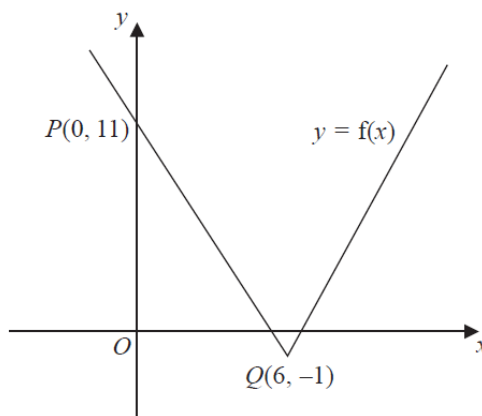
June 13(R) Q2

5.

Figure 1

Figure 1 shows part of the graph with equation $y = f(x)$, $x \in \mathbb{R}$.

The graph consists of two line segments that meet at the point $Q(6, -1)$.

The graph crosses the y-axis at the point $P(0, 11)$.

Sketch, on separate diagrams, the graphs of

(a) $y = |f(x)|$ **(2)**

(b) $y = 2f(-x) + 3$

                                                                                                                                                   (3)

On each diagram, show the coordinates of the points corresponding to P and Q.

Given that $f(x) = a\,|x - b| - 1$, where a and b are constants,

(c) state the value of a and the value of b.   **(2)**

June 14 Q4

6.   (a) Sketch the graph with equation

$$y = |4x - 3|$$

stating the coordinates of any points where the graph cuts or meets the axes.   **(2)**

Find the complete set of values of x for which

(b) $|4x - 3| > 2 - 2x$ **(4)**

(c) $|4x - 3| > \dfrac{3}{2} - 2x$ **(2)**

June 14(R) Q5

7. Given that

$$f(x) = 2e^x - 5, \quad x \in \mathbb{R},$$

(*a*) sketch, on separate diagrams, the curve with equation

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

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

On each diagram, show the coordinates of each point at which the curve meets or cuts the axes.

On each diagram state the equation of the asymptote. **(6)**

(*b*) Deduce the set of values of x for which $f(x) = |f(x)|$. **(1)**

(*c*) Find the exact solutions of the equation $|f(x)| = 2$. **(3)**

June 15 Q2

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8. Given that a and b are positive constants,

(*a*) on separate diagrams, sketch the graph with equation

    (i) $y = |2x - a|$

    (ii) $y = |2x - a| + b$

Show, on each sketch, the coordinates of each point at which the graph crosses or meets the axes. **(4)**

Given that the equation

$$|2x - a| + b = \frac{3}{2}x + 8$$

has a solution at $x = 0$ and a solution at $x = c$,

(*b*) find c in terms of a. **(4)**

June 17 Q6