

**Edexcel (U.K.) Pre 2017**

**Questions By Topic**

**C3 Chap05 Transformations**

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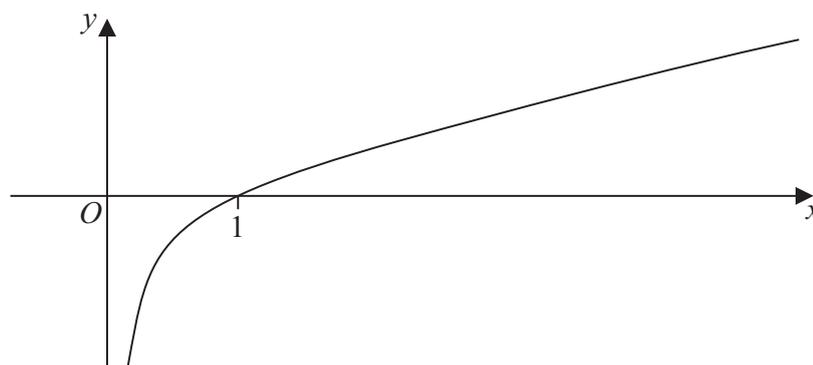
**Figure 1**

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.

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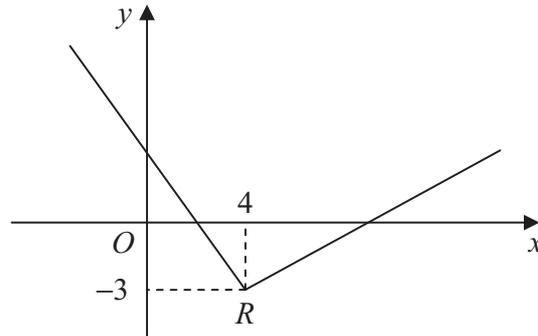
**Figure 1**

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

The graph consists of two line segments that meet at the point  $R(4, -3)$ , as shown in Figure 1.

Sketch, on separate diagrams, the graphs of

(a)  $y = 2f(x+4)$ , (3)

(b)  $y = |f(-x)|$ . (3)

On each diagram, show the coordinates of the point corresponding to  $R$ .

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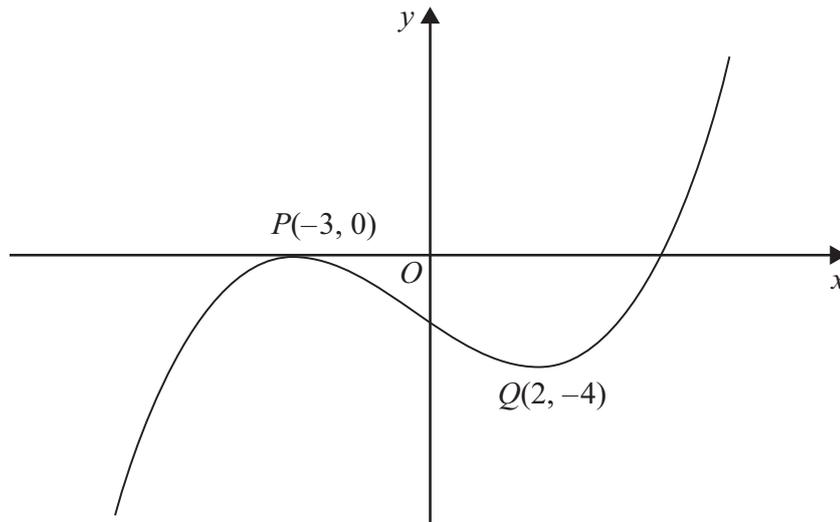
**Figure 1**

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)  $y = |f(x)|$

**(3)**

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

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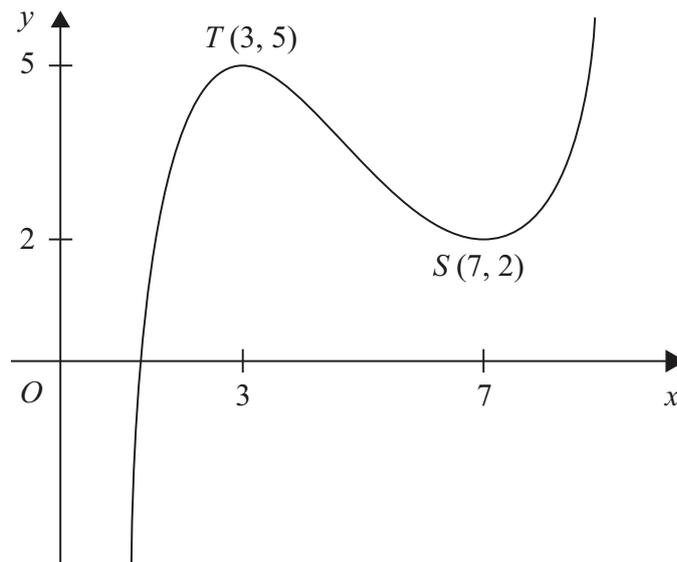
**Figure 1**

Figure 1 shows the graph of  $y = f(x)$ ,  $1 < x < 9$ .  
The points  $T(3, 5)$  and  $S(7, 2)$  are turning points on the graph.

Sketch, on separate diagrams, the graphs of

(a)  $y = 2f(x) - 4$ , (3)

(b)  $y = |f(x)|$ . (3)

Indicate on each diagram the coordinates of any turning points on your sketch.

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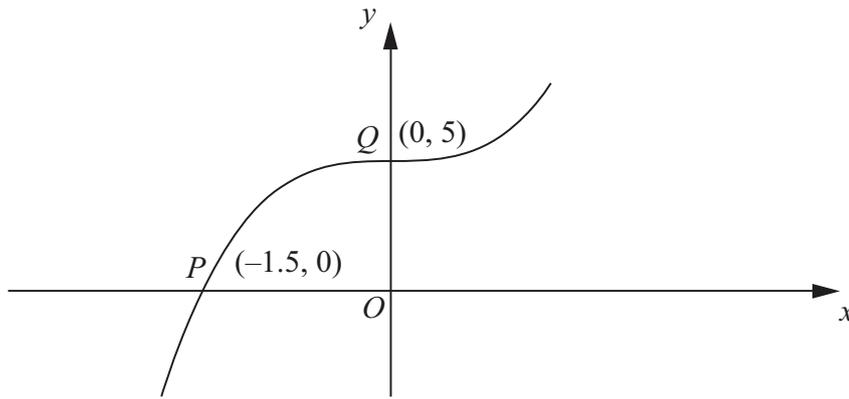
**Figure 2**

Figure 2 shows part of the curve with equation  $y = f(x)$   
The curve passes through the points  $P(-1.5, 0)$  and  $Q(0, 5)$  as shown.

On separate diagrams, sketch the curve with equation

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

(b)  $y = f(|x|)$  (2)

(c)  $y = 2f(3x)$  (3)

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

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1.

Figure 1

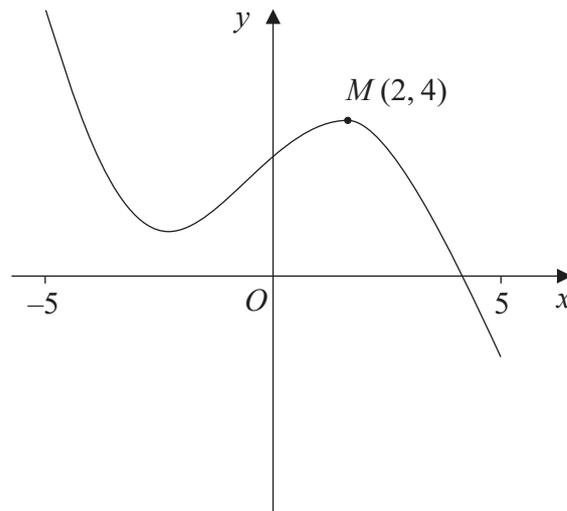


Figure 1 shows the graph of  $y = f(x)$ ,  $-5 \leq x \leq 5$ .  
The point  $M(2, 4)$  is the maximum turning point of the graph.

Sketch, on separate diagrams, the graphs of

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

(b)  $y = |f(x)|$ , (2)

(c)  $y = f(|x|)$ . (3)

Show on each graph the coordinates of any maximum turning points.

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2. Given that

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

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)

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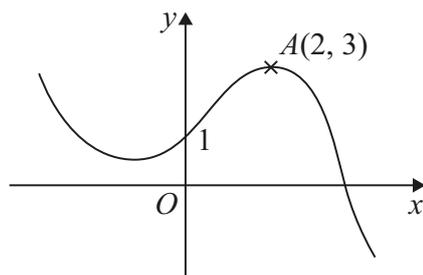
**Figure 1**

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

The graph intersects the  $y$ -axis at the point  $(0, 1)$  and the point  $A(2, 3)$  is the maximum turning point.

Sketch, on separate axes, the graphs of

- (i)  $y = f(-x) + 1$ ,
- (ii)  $y = f(x + 2) + 3$ ,
- (iii)  $y = 2f(2x)$ .

On each sketch, show the coordinates of the point at which your graph intersects the  $y$ -axis and the coordinates of the point to which  $A$  is transformed.

**(9)**



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Figure 1

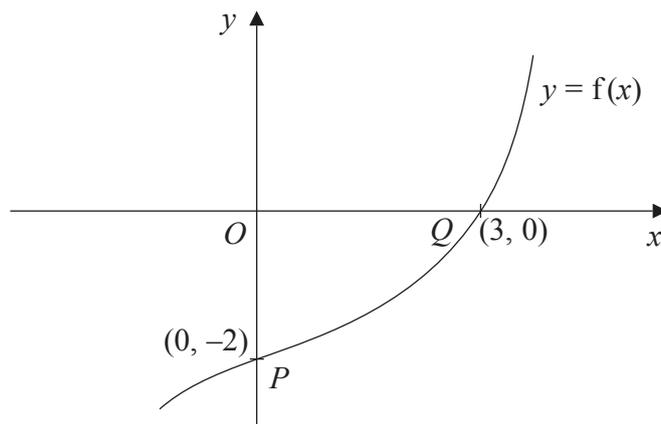


Figure 1 shows part of the curve with equation  $y = f(x)$ ,  $x \in \mathbb{R}$ , where  $f$  is an increasing function of  $x$ . The curve passes through the points  $P(0, -2)$  and  $Q(3, 0)$  as shown.

In separate diagrams, sketch the curve with equation

(a)  $y = |f(x)|$ , (3)

(b)  $y = f^{-1}(x)$ , (3)

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

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

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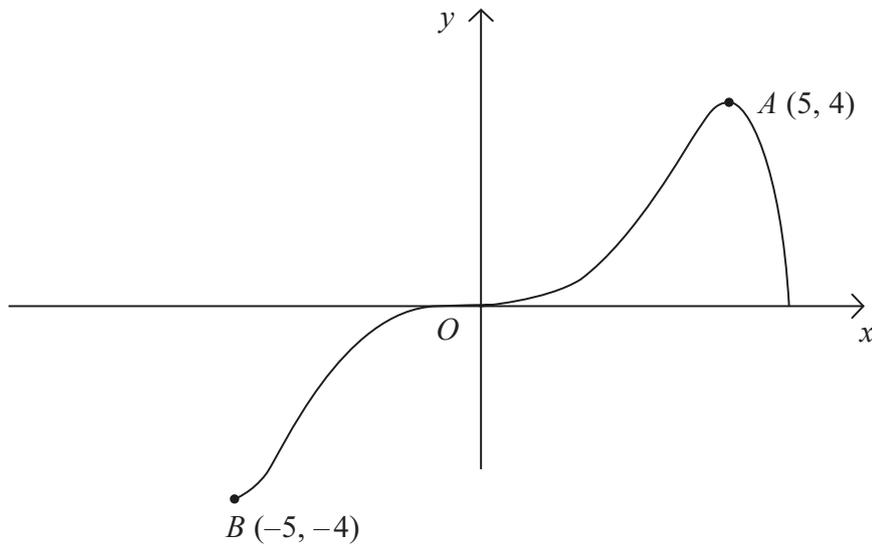
**Figure 1**

Figure 1 shows a sketch of the curve with equation  $y = f(x)$ .  
The curve passes through the origin  $O$  and the points  $A(5, 4)$  and  $B(-5, -4)$ .

In separate diagrams, sketch the graph with equation

(a)  $y = |f(x)|$ , (3)

(b)  $y = f(|x|)$ , (3)

(c)  $y = 2f(x+1)$ . (4)

On each sketch, show the coordinates of the points corresponding to  $A$  and  $B$ .

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Figure 1

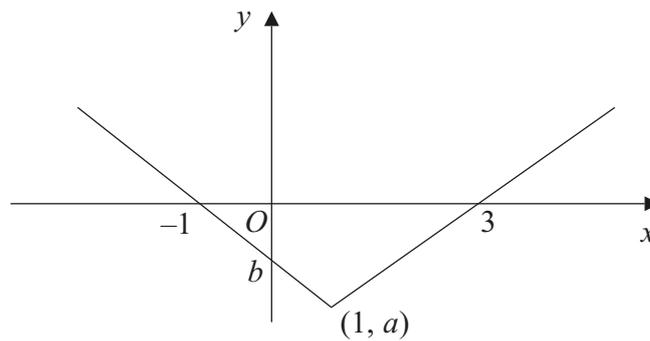


Figure 1 shows part of the graph of  $y = f(x)$ ,  $x \in \mathbb{R}$ . The graph consists of two line segments that meet at the point  $(1, a)$ ,  $a < 0$ . One line meets the  $x$ -axis at  $(3, 0)$ . The other line meets the  $x$ -axis at  $(-1, 0)$  and the  $y$ -axis at  $(0, b)$ ,  $b < 0$ .

In separate diagrams, sketch the graph with equation

(a)  $y = f(x + 1)$ , (2)

(b)  $y = f(|x|)$ . (3)

Indicate clearly on each sketch the coordinates of any points of intersection with the axes.

Given that  $f(x) = |x - 1| - 2$ , find

(c) the value of  $a$  and the value of  $b$ , (2)

(d) the value of  $x$  for which  $f(x) = 5x$ . (4)

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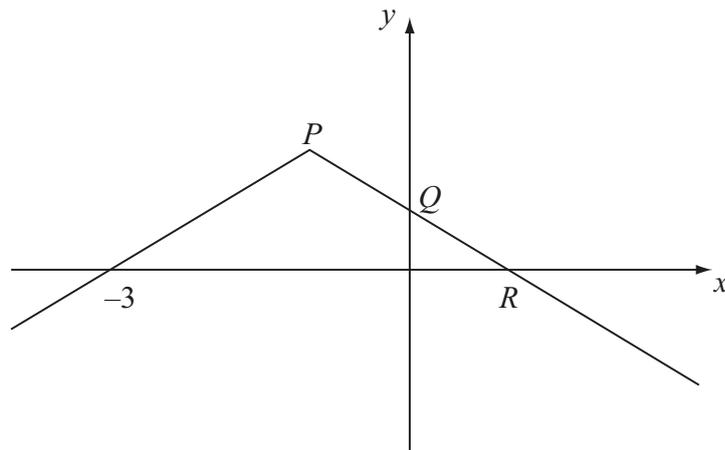


Figure 1

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

The graph consists of two line segments that meet at the point  $P$ .

The graph cuts the  $y$ -axis at the point  $Q$  and the  $x$ -axis at the points  $(-3, 0)$  and  $R$ .

Sketch, on separate diagrams, the graphs of

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

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

Given that  $f(x) = 2 - |x + 1|$ ,

(c) find the coordinates of the points  $P$ ,  $Q$  and  $R$ , (3)

(d) solve  $f(x) = \frac{1}{2}x$ . (5)

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