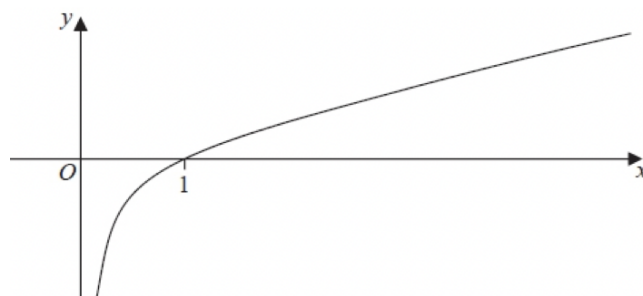


Question 1:

Below is a sketch of $y = f(x)$



On separate diagrams, sketch the curve with equation

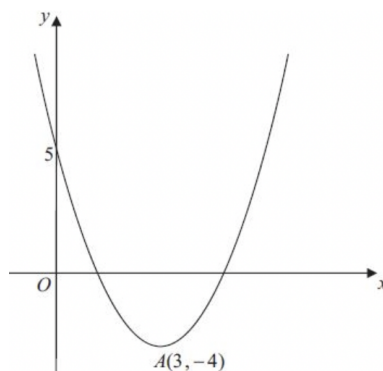
(a) [2 marks] $y = f(2x), x > 0$

(b) [3 marks] $y = |f(x)|, x > 0$

Indicate clearly on each sketch the coordinates of the point at which the curve crosses or meets the x -axis.

Question 2:

Below is a sketch of $y = f(x)$



(a) [4 marks] Write down the coordinates of the point to which A is transformed on the curve with equation

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

(ii) $y = 2f\left(\frac{1}{2}x\right)$

(b) [3 marks] Sketch the curve with equation $y = f(|x|)$

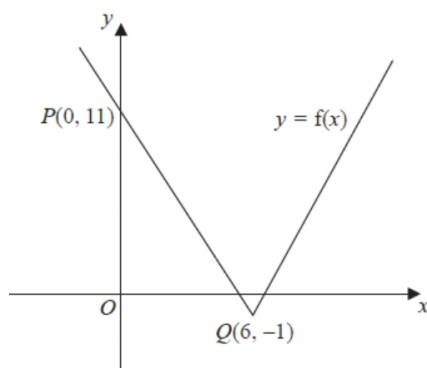
On your sketch show the coordinates of all turning points and the coordinates of the point at which the curve cuts the y -axis.

The curve with equation $y = f(x)$ is a translation of the curve with equation $y = x^2$.

(c) [2 marks] Find $f(x)$

(d) [1 mark] Explain why the function f does **not** have an inverse.

Question 3:



On separate diagrams, sketch the curve with equation

- (a) [2 marks] $y = |f(x)|$
- (b) [3 marks] $y = 2f(-x) + 3$

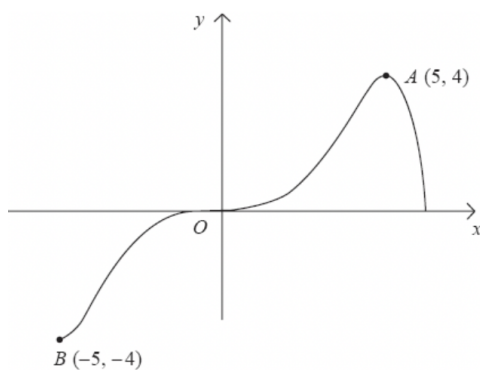
On each diagram, show the coordinates of the points corresponding to P and Q .

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

- (c) [2 marks] state the value of a and the value of b .

Question 4:

Below is a sketch of $y = f(x)$



On separate diagrams, sketch the curve with equation

- (a) [3 marks] $y = |f(x)|$
- (b) [3 marks] $y = f(|x|)$
- (c) [4 marks] $y = 2f(x + 1)$

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

Question 5:

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

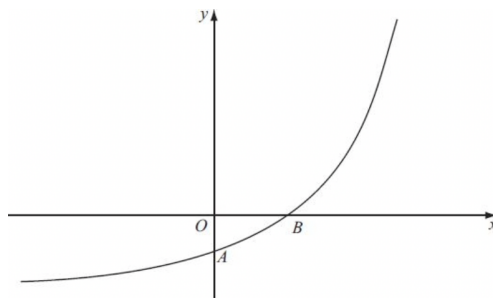
- (a) [2 marks] Sketch the graph with equation $y = f(x)$, showing the coordinates of the points where the graph cuts or meets the axes.
- (b) [3 marks] Solve $f(x) = 15 + x$

$$g(x) = x^2 - 4x + 1 \quad 0 \leq x \leq 5$$

- (c) [2 marks] Find $fg(2)$
- (d) [3 marks] Find the range of g .

Question 6:

Below is a sketch of $y = f(x)$



The curve meets the axes at the points $A(0, 1 - k)$ and $B\left(\frac{1}{2} \ln k, 0\right)$ where $k > 1$ is a constant.

On separate diagrams, sketch the curve with equation

- (a) [3 marks] $y = |f(x)|$
- (b) [2 marks] $y = f^{-1}(x)$

Show on each sketch the coordinates, in terms of k , of each point at which the curve meets or cuts the axes.

Given that $f(x) = e^{2x} - k$

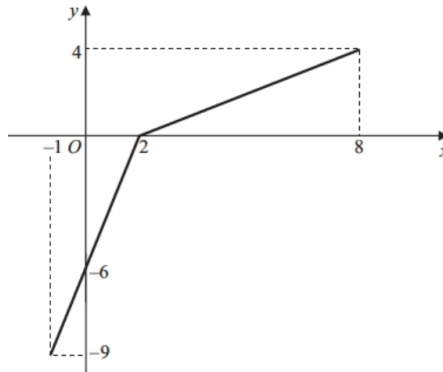
- (c) [1 mark] state the range of f
- (d) [3 marks] find $f^{-1}(x)$
- (e) [1 mark] write down the domain of f^{-1}

Question 7:

$$f(x) = \frac{3 - 2x}{x - 5} \quad x \in \mathbb{R}, x \neq 5$$

(a) [3 marks] Find $f^{-1}(x)$

Below is a sketch of $y = g(x)$



The function g has domain $-1 \leq x \leq 8$ and is linear from $(-1, -9)$ to $(2, 0)$ and from $(2, 0)$ to $(8, 4)$.

(b) [1 mark] Write down the range of g .

(c) [2 marks] Find $g^2(2)$

(d) [2 marks] Find $fg(8)$

(e) [4 marks] On separate diagrams, sketch the graph with equation

(i) $y = |g(x)|$

(ii) $y = g^{-1}(x)$

Show on each sketch the coordinates of each point at which the graph meets or cuts the axes.

(f) [1 mark] State the domain of g^{-1}