

2.

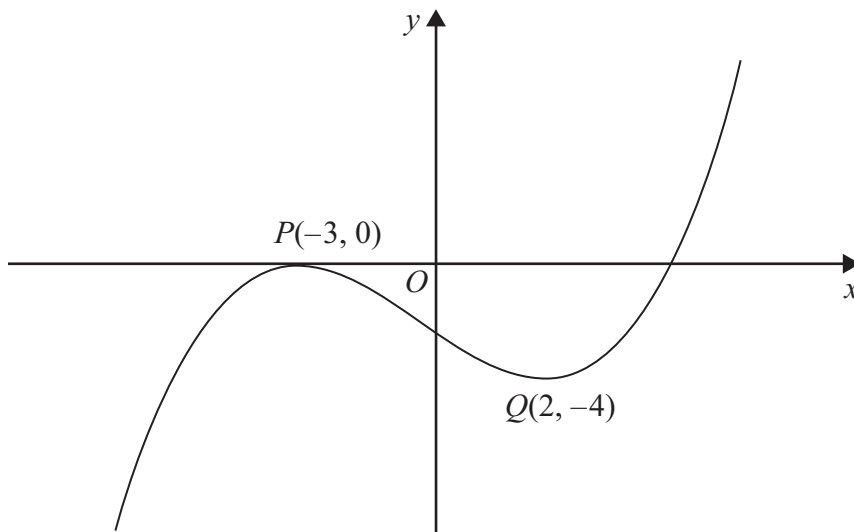


Figure 1

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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Question 2 continued

Q2

(Total 6 marks)



6. $f(x) = x^2 - 3x + 2 \cos(\frac{1}{2}x), 0 \leq x \leq \pi$

(a) Show that the equation $f(x)=0$ has a solution in the interval $0.8 < x < 0.9$ (2)

The curve with equation $y=f(x)$ has a minimum point P .

(b) Show that the x -coordinate of P is the solution of the equation

$$x = \frac{3 + \sin(\frac{1}{2}x)}{2}$$
 (4)

(c) Using the iteration formula

$$x_{n+1} = \frac{3 + \sin(\frac{1}{2}x_n)}{2}, x_0 = 2$$

find the values of x_1, x_2 and x_3 , giving your answers to 3 decimal places. (3)

(d) By choosing a suitable interval, show that the x -coordinate of P is 1.9078 correct to 4 decimal places. (3)

Handwritten area with horizontal lines for working.



