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5.

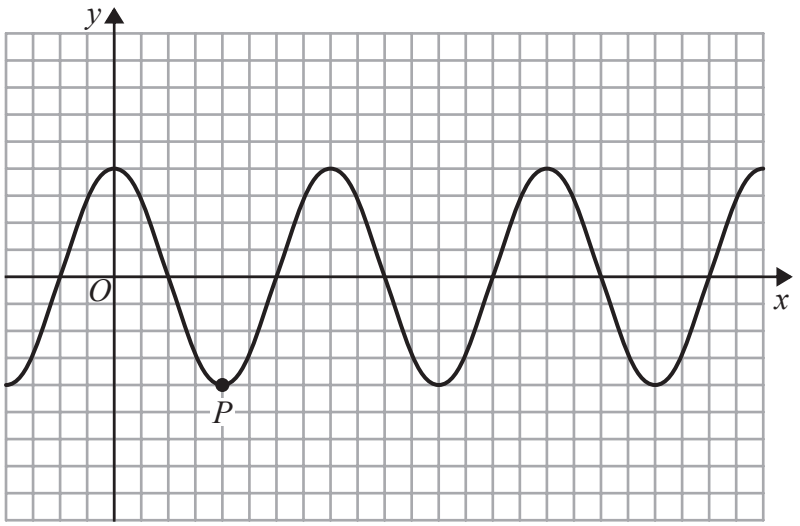


Figure 2

Figure 2 shows a plot of part of the curve with equation $y = \cos 2x$ with x being measured in radians.

The point P, shown on Figure 2, is a minimum point on the curve.

(a) State the coordinates of P.

(2)

A copy of Figure 2, called Diagram 1, is shown at the top of the next page.

(b) Sketch, on Diagram 1, the curve with equation $y = \sin x$

(2)

(c) Hence, or otherwise, deduce the number of solutions of the equation

(i) $\cos 2x = \sin x$ that lie in the region $0 \leqslant x \leqslant 20\pi$

(ii) $\cos 2x = \sin x$ that lie in the region $0 \leqslant x \leqslant 21\pi$

(2)

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Question 5 continued

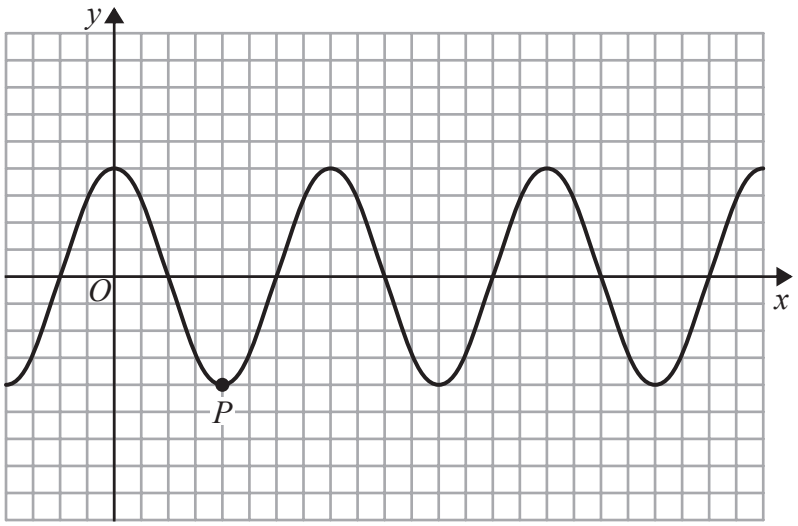


Diagram 1

Q5

(Total 6 marks)

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6. (*Solutions based entirely on graphical or numerical methods are not acceptable.*)

Given

$$f(x) = 2x^{\frac{5}{2}} - 40x + 8 \qquad x > 0$$

(a) solve the equation $f'(x) = 0$

(4)

(b) solve the equation $f''(x) = 5$

(3)

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