

Harder Trig Functions

Difficulty: Easy

Question Paper 1

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|------------|-----------------------|
| Level | A Level only |
| Subject | Maths - Pure |
| Exam Board | Edexcel |
| Topic | Differentiation |
| Sub-Topic | Harder Trig Functions |
| Difficulty | Easy |
| Booklet | Question Paper 1 |

Time allowed: 31 minutes

Score: /26

Percentage: /100

Grade Boundaries:

| A* | A | B | C | D | E | U |
|------|-----|-----|-----|-----|-----|------|
| >76% | 61% | 52% | 42% | 33% | 23% | <23% |

Question 1

(a) Differentiate with respect to x

(i) $3 \sin^2 x + \sec 2x$,

(3)

(Total 3 marks)

Question 2

The point P is the point on the curve $x = 2 \tan\left(y + \frac{\pi}{12}\right)$ with y -coordinate $\frac{\pi}{4}$.

Find an equation of the normal to the curve at P .

(7)

(Total 7 marks)

Question 3

(b) Given that $x = 3 \tan 2y$ find $\frac{dy}{dx}$ in terms of x .

(5)

(Total 5 marks)

Question 4

Given that $x = \sec 4y$, find

(a) $\frac{dy}{dx}$ in terms of y .

(2 marks)

(b) Show that $\frac{dy}{dx} = \frac{k}{x\sqrt{x^2-1}}$, where k is a constant which should be found.

(3 marks)

(Total 5 marks)

Question 5

Differentiate with respect to x

(iii) $\tan^2 x$.

(2)

Given that $x = \cos y^2$,

(iv) find $\frac{dy}{dx}$ in terms of y .

(4)

(Total 6 marks)