

Implicit

Difficulty: Medium

Question Paper 1

Level	A Level
Subject	Maths Pure 3
Exam Board	CIE
Topic	Differentiation
Sub-Topic	Implicit
Difficulty	Medium
Booklet	Question Paper 1

Time allowed: 42 minutes

Score: /30

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E
>90%	81%	70%	58%	46%	34%

Question 1

A curve has equation

$$\sin y \ln x = x - 2 \sin y,$$

for $-\frac{1}{2}\pi \leq y \leq \frac{1}{2}\pi$.

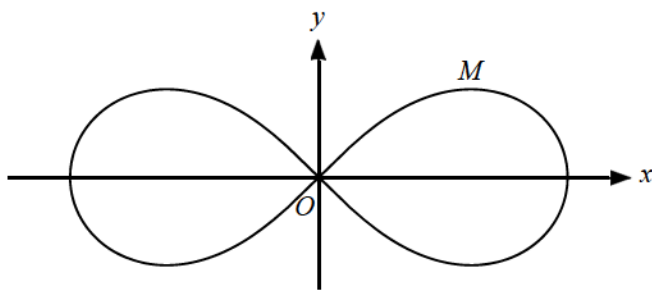
(i) Find $\frac{dy}{dx}$ in terms of x and y . [5]

(ii) Hence find the exact x -coordinate of the point on the curve at which the tangent is parallel to the x -axis. [3]

Question 2

The equation of a curve is $xy(x + y) = 2a^3$, where a is a non-zero constant. Show that there is only one point on the curve at which the tangent is parallel to the x -axis, and find the coordinates of this point. [8]

Question 3



The diagram shows the curve $(x^2 + y^2)^2 = 2(x^2 - y^2)$ and one of its maximum points M . Find the coordinates of M . [7]

Question 4

The equation of a curve is $xy(x - 6y) = 9a^3$, where a is a non-zero constant. Show that there is only one point on the curve at which the tangent is parallel to the x -axis, and find the coordinates of this point. [7]