



Coordinate Geometry

Questions

Suitable for:

Pearson Edexcel International A-Level (iAL) — Pure Mathematics 4



Question 1

A curve C is defined by the parametric equations

$$x = 2t + 1, \quad y = t - 3$$

Find the Cartesian equation of C .

(2 marks)

Total for question = 2 marks



Question 2

A curve C is defined by the parametric equations

$$x = t^2, \quad y = 2t, \quad t \in \mathbb{R}$$

Find the Cartesian equation of C .

(3 marks)

Total for question = 3 marks



Question 3

A curve C is defined by the parametric equations

$$x = 3\cos \theta, \quad y = 4\sin \theta, \quad 0 \leq \theta < 2\pi$$

Show that the Cartesian equation of C is

$$\frac{x^2}{9} + \frac{y^2}{16} = 1$$

(3 marks)

Total for question = 3 marks





Question 4

A curve C is defined by the parametric equations

$$x = \tan \theta, \quad y = \sec \theta$$

Find the Cartesian equation of C .

(3 marks)

Total for question = 3 marks



Question 5

A curve C has parametric equations

$$x = t^2 + 1, \quad y = t^3 - t$$

(a) Complete the table of values below.

t	-1	0	1	2
x				
y				

(2 marks)

(b) Find the coordinates of all points where the curve crosses the x -axis.

(3 marks)

(c) Explain why the point $(2, 0)$ is a self-intersection of the curve.

(1 marks)

Total for question = 6 marks





Question 6

Sketch the curve with parametric equations

$$x = \cos \theta, \quad y = \sin 2\theta, \quad 0 \leq \theta \leq 2\pi$$

marking clearly the coordinates of any points where the curve meets the coordinate axes, any maximum and minimum points, and any self-intersections.

(5 marks)

Total for question = 5 marks



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Question 7

A curve has parametric equations

$$x = 2 + \sin \theta, \quad y = 3 - \cos \theta$$

(a) Find the Cartesian equation of the curve.

(3 marks)

(b) Describe the curve fully.

(2 marks)

Total for question = 5 marks

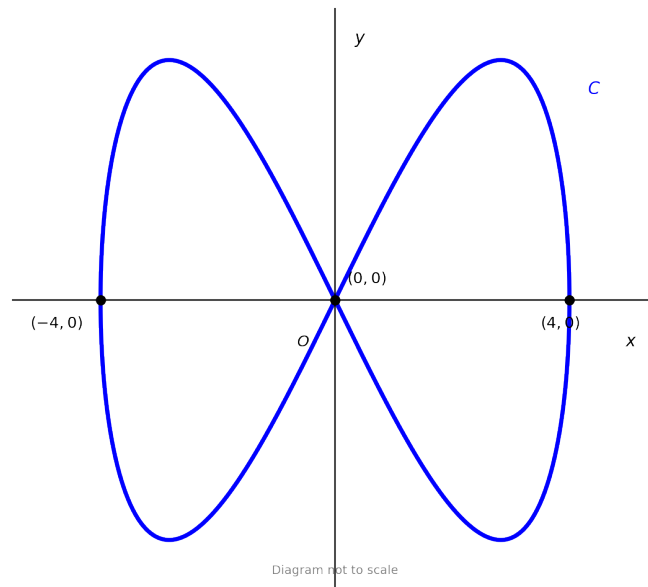




Question 8

Figure 1 shows a sketch of the curve C with parametric equations

$$x = 4\cos\theta, \quad y = 7\sin 2\theta, \quad 0 \leq \theta < 2\pi$$



(a) Find the coordinates of all points where C crosses the x -axis.

(3 marks)

(b) Find the coordinates of all points on C where y has its maximum and minimum values.

(4 marks)

(c) Show that the Cartesian equation of C can be written as

$$y^2 = \frac{49x^2(16 - x^2)}{64}$$

(4 marks)

Total for question = 11 marks