1 A curve has the parametric equations

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

(a) Find a cartesian equation for the curve.

(3)

(b) Sketch the curve

(3)

(Total for question 1 is 6 marks)

2 A curve has the parametric equations

$$x = \ln(t+1), \quad y = t^2 - 5, \quad t > -1$$

Find the points where the curve crosses the coordinate axes.

(Total for question 2 is 2 marks)

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3 A circle is defined by the parametric equations $x = 5 + 2\cos\theta$, $y = 3 + 2\sin\theta$
Find the centre and the radius of the circle.

(Total for question 3 is 3 marks)

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4 The curve C has parametric equations

$$x = \frac{3-2t}{t+1} \quad y = \frac{3t+1}{t+1} \quad 0 \leq t \leq 5$$

(a) Show that C is part of a straight line.

(3)

(b) Find the length of the line segment.

(2)

(Total for question 4 is 5 marks)

5 A curve has the parametric equations

$$x = t + 1, \quad y = \frac{2}{t}$$

(a) Find a cartesian equation for the curve.

(2)

(b) Sketch the curve

(3)

(Total for question 5 is 5 marks)

6 A curve C has parametric equations

$$x = \tan t + 2, \quad y = \sec^2 t - 1 \quad 0 \leq t \leq 2\pi$$

(a) Find an equation for C in the form $y = f(x)$ and state the domain for which the curve is defined.

(3)

(b) Sketch the curve

(3)

(Total for question 6 is 6 marks)

7 A curve C has parametric equations

$$x = 2\cos t - 1, \quad y = 4\sin^2 t + 3 \quad 0 \leq t \leq 2\pi$$

(a) Find an equation for C in the form $y = f(x)$ and state the domain for which the curve is defined.

(3)

(b) Sketch the curve

(3)

(Total for question 7 is 6 marks)

8 A curve C has parametric equations

$$x = 3 + 2\cos t, \quad y = 2 + 4\cos 2t \quad 0 \leq t \leq 2\pi$$

(a) Find an equation for C in the form $y = f(x)$ and state the domain for which the curve is defined.

(3)

(b) Sketch the curve

(3)

(Total for question 8 is 6 marks)

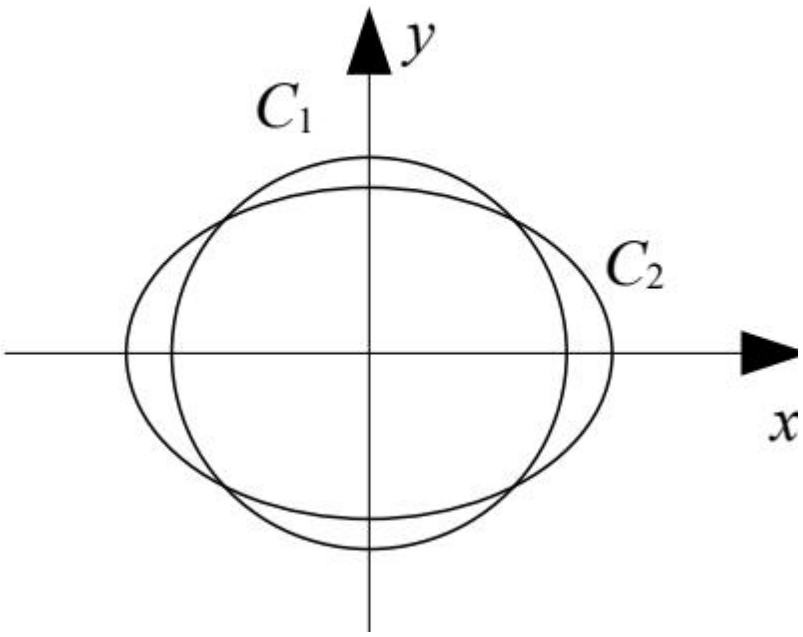
9 A curve C_1 with parametric equations

$$x = 6\cos t, \quad y = 2\sqrt{5}\sin t \quad 0 \leq t < 2\pi$$

meets the circle C_2 with equation

$$x^2 + y^2 = 25$$

at four distinct points as shown in the diagram.



Find the Cartesian coordinates of the points of intersection.

(Total for question 9 is 6 marks)