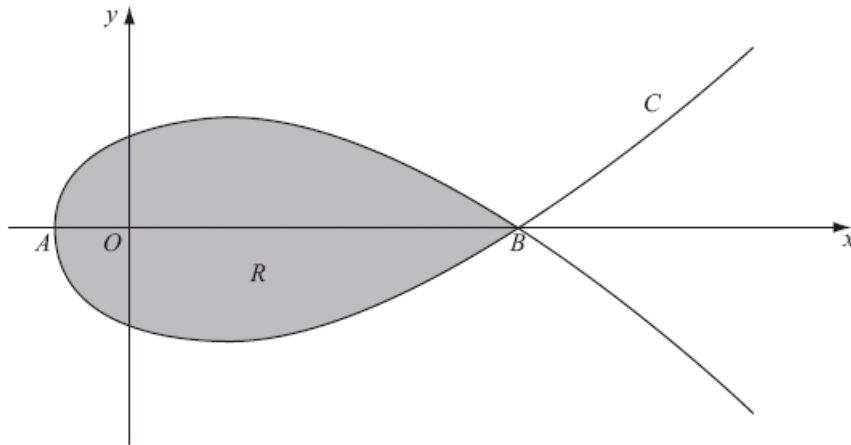


Year 2 Pure Chapter 8: Parametric Equations - Exam Questions (Total Marks 25)

1.



The diagram above shows a sketch of the curve C with parametric equations

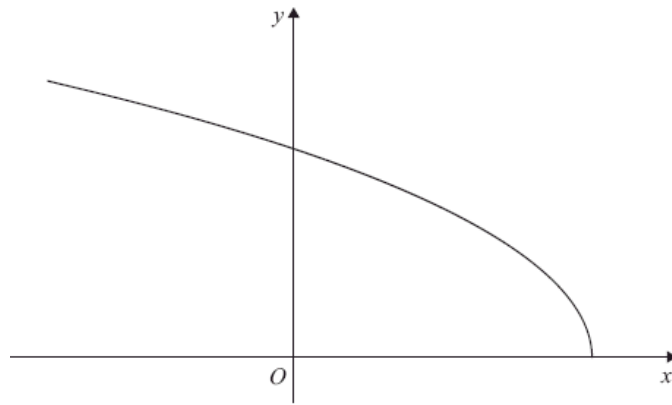
$$x = 5t^2 - 4, \quad y = t(9 - t^2)$$

The curve C cuts the x -axis at the points A and B .

- (a) Find the x -coordinate at the point A and the x -coordinate at the point B .

(3)
(Total 3 marks)

2.



The diagram above shows a sketch of the curve with parametric equations

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

- (a) Find a cartesian equation of the curve in the form

$$y = f(x), \quad -k \leq x \leq k,$$

stating the value of the constant k .

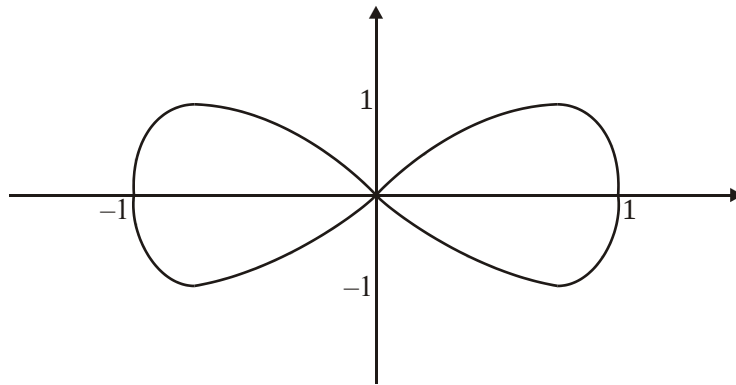
(4)

- (b) Write down the range of $f(x)$.

(2)

(Total 6 marks)

3.



The curve shown in the diagram above has parametric equations

$$x = \cos t, \quad y = \sin 2t, \quad 0 \leq t < 2\pi.$$

- (a) Show that a cartesian equation for the part of the curve where $0 \leq t < \pi$ is

$$y = 2x\sqrt{1 - x^2}.$$

(3)

- (b) Write down a cartesian equation for the part of the curve where $\pi \leq t < 2\pi$.

(1)

(Total 4 marks)

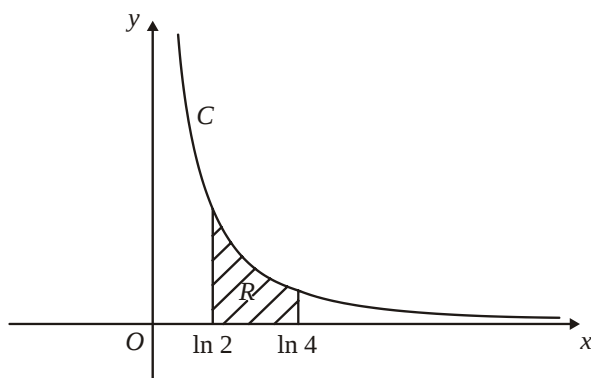
4. A curve has parametric equations

$$x = 2 \cot t, \quad y = 2 \sin^2 t, \quad 0 < t \leq \frac{\pi}{2}.$$

- (a) Find a cartesian equation of the curve in the form $y = f(x)$. State the domain on which the curve is defined.

(4)
(Total 4 marks)

5.



The curve C has parametric equations

$$x = \ln(t+2), \quad y = \frac{1}{(t+1)}, \quad t > -1$$

- (a) Find a cartesian equation of the curve C , in the form $y = f(x)$.

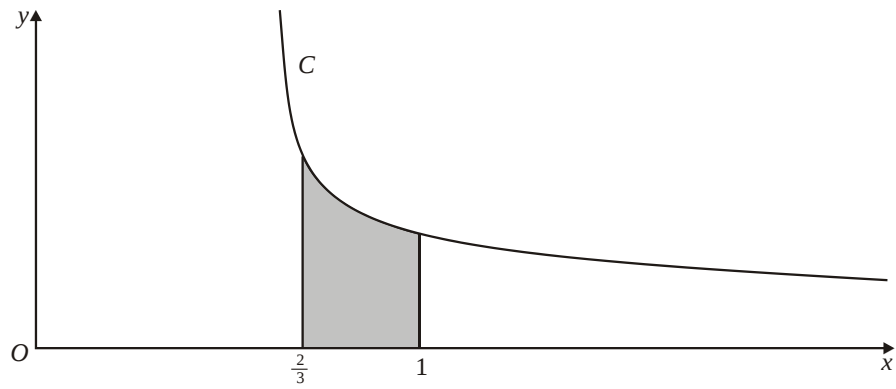
(4)

- (b) State the domain of values for x for this curve.

(1)

(Total 5 marks)

6.



The curve C has parametric equations

$$x = \frac{1}{1+t}, \quad y = \frac{1}{1-t}, \quad |t| < 1.$$

- (a) Show that C satisfies the cartesian equation $y = \frac{x}{2x-1}$.

(3)
(Total 3 marks)