

Parametric Equations - Edexcel Past Exam Questions

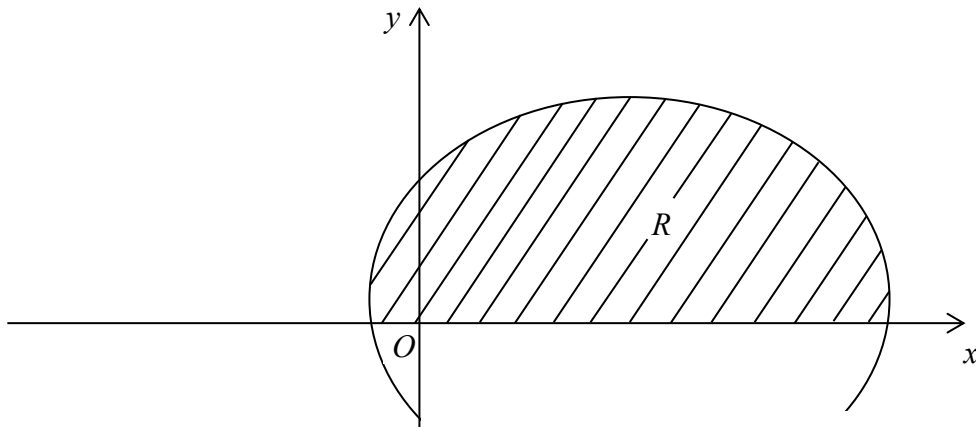
1. A curve has parametric equations

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

Find a cartesian equation of the curve in the form $y = f(x)$. State the domain on which the curve is defined. (4)

June 05 Q6(edited)

2. **Figure 2**



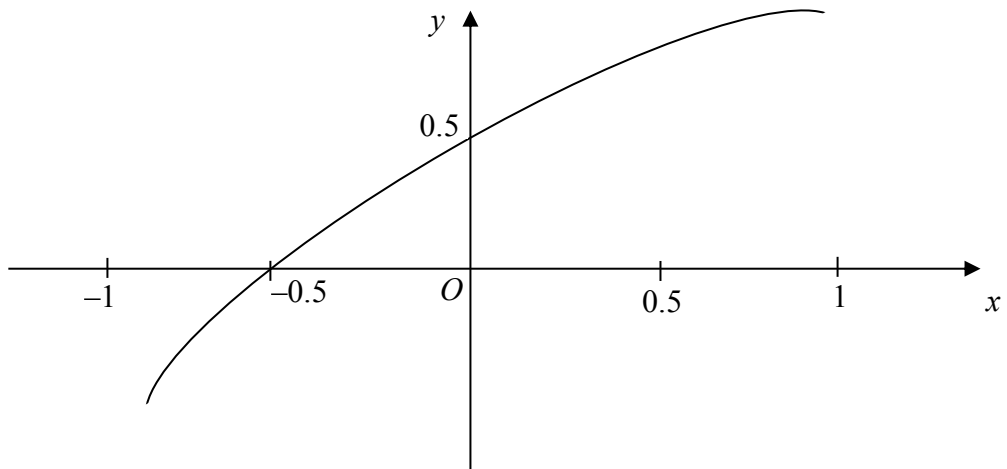
The curve shown in Figure 2 has parametric equations

$$x = t - 2 \sin t, \quad y = 1 - 2 \cos t, \quad 0 \leq t \leq 2\pi.$$

Show that the curve crosses the x -axis where $t = \frac{\pi}{3}$ and $t = \frac{5\pi}{3}$. (2)

Jan 06 Q8(edited)

3.

Figure 2


The curve shown in Figure 2 has parametric equations

$$x = \sin t, \quad y = \sin\left(t + \frac{\pi}{6}\right), \quad -\frac{\pi}{2} < t < \frac{\pi}{2}.$$

Show that a cartesian equation of the curve is

$$y = \frac{\sqrt{3}}{2}x + \frac{1}{2}\sqrt{(1-x^2)}, \quad -1 < x < 1. \quad (3)$$

June 06 Q4(edited)

4. A curve has parametric equations

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

Find a cartesian equation of the curve in the form $y^2 = f(x)$.

(4)

June 07 Q6(edited)

5. A 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)

Jan 08 Q7(*edited*)

- 6.

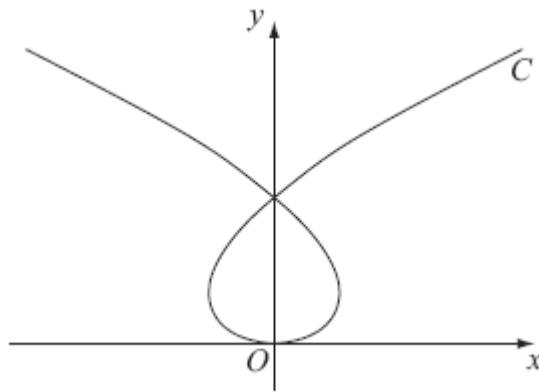


Figure 3

The curve C shown in Figure 3 has parametric equations

$$x = t^3 - 8t, \quad y = t^2$$

where t is a parameter. Given that the point A has parameter $t = -1$,

- (a) find the coordinates of A . (1)

The line l is the tangent to C at A and has equation $2x - 5y - 9 = 0$.

The line l also intersects the curve at the point B .

- (b) Find the coordinates of B . (6)

Jan 09 Q7(*edited*)

7.

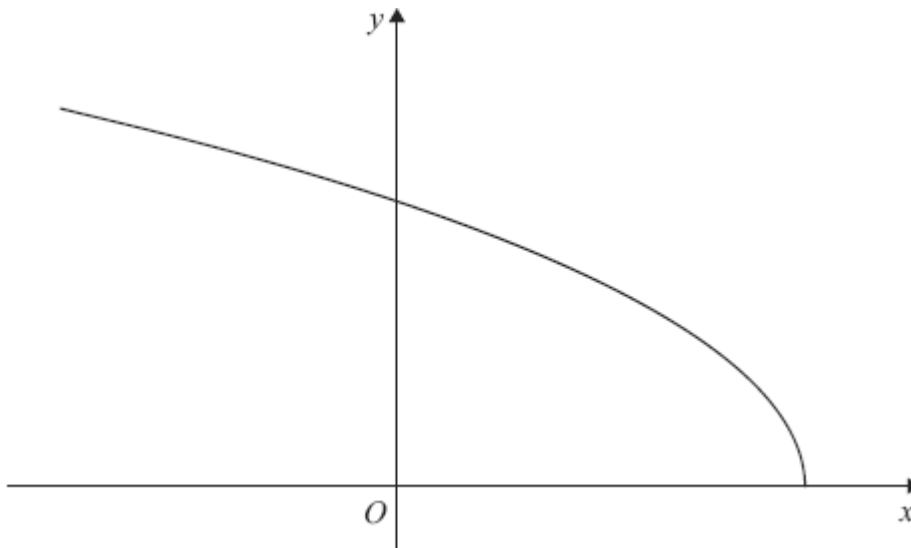
**Figure 2**

Figure 2 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)

June 09 Q5(edited)

8.

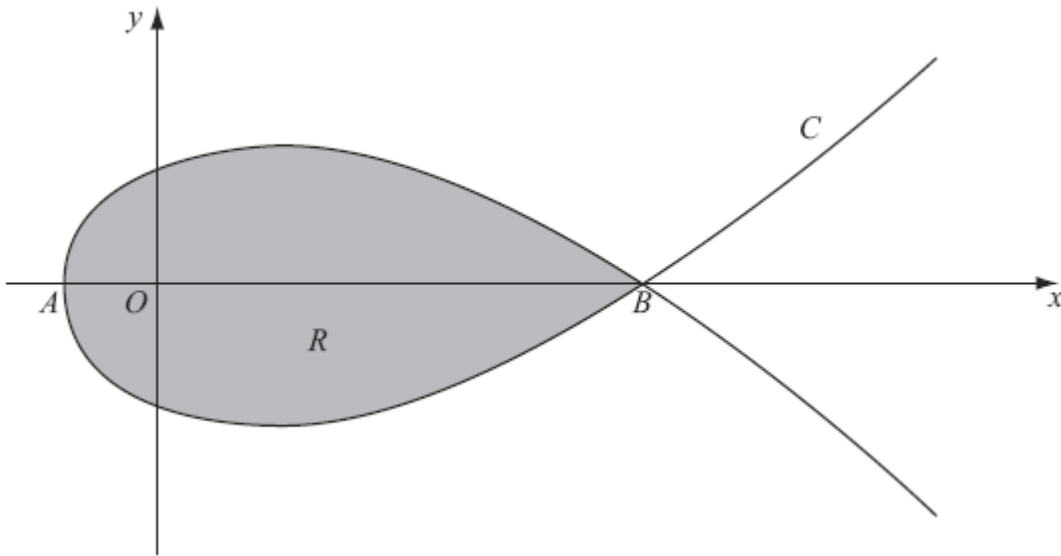

Figure 2

Figure 2 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 .

Find the x -coordinate at the point A and the x -coordinate at the point B .

(3)

Jan 10 Q7(edited)

 9. The curve C has parametric equations

$$x = \ln t, \quad y = t^2 - 2, \quad t > 0.$$

Find a cartesian equation of C .

(3)

Jan 11 Q6(edited)

10.

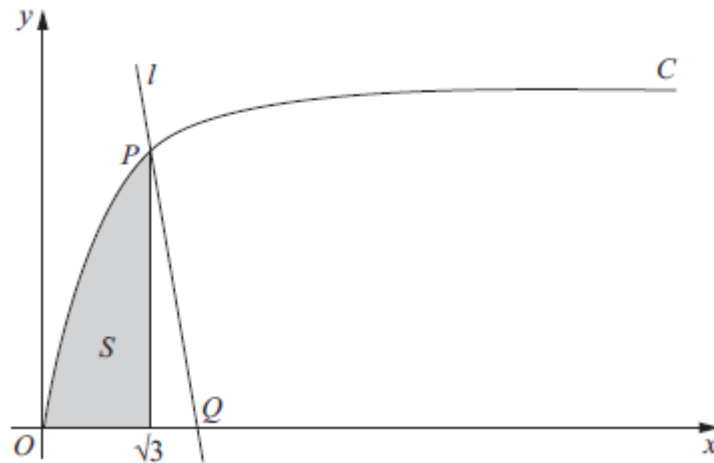


Figure 3

Figure 3 shows part of the curve C with parametric equations

$$x = \tan \theta, \quad y = \sin \theta, \quad 0 \leq \theta < \frac{\pi}{2}.$$

The point P lies on C and has coordinates $\left(\sqrt{3}, \frac{1}{2}\sqrt{3}\right)$.

(a) Find the value of θ at the point P . (2)

June 11 Q7(edited)