

(43) Sketching Parametric Curves

WORKING AT D/E

(1) A curve has parametric equations:

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

(a) Complete the table below

t	-2	-1	0	1	2	3
x						
y						

(b) Hence, **plot** the curve given by the parametric equations: $x = 2t$, $y = t^2$, $-2 \leq t \leq 3$ on graph or squared paper.

(2) A curve has parametric equations:

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

(a) Complete the table below

t	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
x					
y					

(b) Hence, **plot** the curve given by the parametric equations: $x = 3 \cos t$, $y = 2 \sin t$, $0 \leq t \leq 2\pi$ on graph or squared paper.

WORKING AT B/C

(1) A curve has parametric equations:

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

(a) Construct a table to find the values of x and y for common trigonometric values of t , for $0 \leq t \leq \frac{\pi}{2}$

(b) Hence, **plot** the curve given by the parametric equations: $x = \cos 2t$, $y = \sin t$, $0 \leq t \leq \frac{\pi}{2}$ on graph or squared paper.

(2) A curve has parametric equations:

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

Plot the curve on squared paper.

(3) A curve has parametric equations:

$$x = \frac{1}{t}, \quad y = 0.5t^2, \quad 1 \leq t \leq 4$$

Plot the curve on squared paper.

WORKING AT A*/A

(1) A curve has parametric equations:

$$x = 2 \sec t, \quad y = \tan t, \quad -\frac{\pi}{4} \leq t \leq \frac{\pi}{4}$$

Plot the curve on squared paper showing the coordinates in exact form where appropriate.

(2) A curve has parametric equations:

$$x = 4 + 9 \cos 2t, \quad y = 9 \sin 2t - 3, \quad 0 \leq t \leq \pi$$

(a) Find the cartesian equation of the curve.

(b) Hence, sketch the curve.

(c) Find the length of the curve in exact form.

(3) A curve has parametric equations:

$$x = 3 \cos 6t, \quad y = 2 \sin 6t, \quad 0 \leq t \leq \pi$$

(a) Show that the curve does not form part of a circle.

(b) Sketch the curve showing where it meets or crosses the coordinate axes.