

Section 1: Using parametric equations

Solutions to Exercise level 1

1. (i) $x = 1 - t \Rightarrow t = 1 - x$

$$y = t^2 - 4$$

$$= (1 - x)^2 - 4$$

$$= 1 - 2x + x^2 - 4$$

$$= x^2 - 2x - 3$$

(ii) $y = \frac{1}{t} \Rightarrow t = \frac{1}{y}$

$$x = 2t^2 \Rightarrow x = 2 \left(\frac{1}{y} \right)^2 = \frac{2}{y^2}$$

$$xy^2 = 2$$

(iii) $x = 2\cos\theta + \sin\theta \Rightarrow x^2 = 4\cos^2\theta + 4\cos\theta\sin\theta + \sin^2\theta$

$$y = \cos\theta - 2\sin\theta \Rightarrow y^2 = \cos^2\theta - 4\cos\theta\sin\theta + 4\sin^2\theta$$

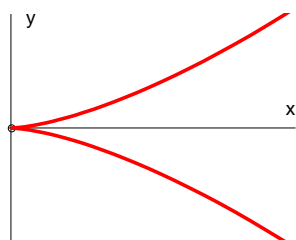
Adding: $x^2 + y^2 = 5\cos^2\theta + 5\sin^2\theta = 5(\cos^2\theta + \sin^2\theta)$

$$x^2 + y^2 = 5$$

2. (i)

t	-3	-2	-1	0	1	2	3
x	9	4	1	0	1	4	9
y	-27	-8	-1	0	1	8	27

(ii)



(iii) $x = t^2 \Rightarrow t = \pm\sqrt{x}$

$$y = t^3 = (\pm\sqrt{x})^3$$

$$y = \pm x^{\frac{3}{2}}$$