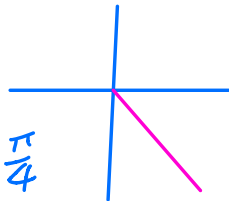


## Exercise 5B

1c)

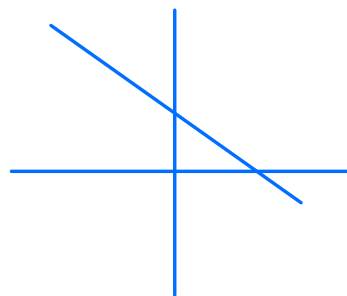
$$\theta = -\frac{\pi}{4}$$



$$1f) r = 2 \sec\left(\theta - \frac{\pi}{3}\right)$$

$$r = \frac{2}{\cos\left(\theta - \frac{\pi}{3}\right)}$$

$\theta$	0	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{5\pi}{6}$	$\pi$
$r$	4	2.3	2	2.3	4	$\infty$	-4



$$1i) r = a \cos 3\theta$$

$$\theta \quad 0 \quad \frac{\pi}{6} \quad \frac{\pi}{3} \quad \frac{\pi}{2} \quad \frac{2\pi}{3} \quad \frac{5\pi}{6} \quad \pi$$

$$r \quad a \quad 0 \quad -a \quad 0 \quad a \quad 0 \quad -a$$

$$\frac{\pi}{4}$$

$$-0.7$$



Mei Jun 06

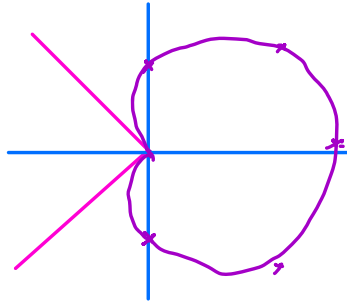
- 1 (a) A curve has polar equation  $r = a(\sqrt{2} + 2\cos\theta)$  for  $-\frac{3}{4}\pi \leq \theta \leq \frac{3}{4}\pi$ , where  $a$  is a positive constant.

(i) Sketch the curve.

[2]

$$\theta \quad -\frac{3\pi}{4} \quad -\frac{\pi}{2} \quad -\frac{\pi}{4} \quad 0 \quad \frac{\pi}{4} \quad \frac{\pi}{2} \quad \frac{3\pi}{4}$$

$$r \quad 0 \quad \frac{\sqrt{2}a}{1.4a} \quad 2.8a \quad 1.4a \quad 2.8a \quad 1.4a \quad 0$$



- 1 (a) A curve has polar equation  $r = ae^{-k\theta}$  for  $0 \leq \theta \leq \pi$ , where  $a$  and  $k$  are positive constants. The points A and B on the curve correspond to  $\theta = 0$  and  $\theta = \pi$  respectively.

(i) Sketch the curve.

[2]

$$\theta \quad 0 \quad \frac{\pi}{4} \quad \frac{\pi}{2} \quad \frac{3\pi}{4} \quad \pi$$

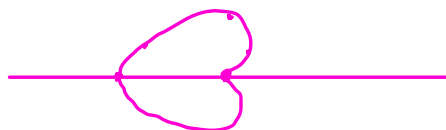
$$r \quad a \quad .46a \quad .21a \quad .09a \quad .04a$$



$$r = a(1 - \cos \theta)$$

$$\theta \quad 0 \quad \frac{\pi}{4} \quad \frac{\pi}{2} \quad \frac{3\pi}{4} \quad \pi$$

$$r \quad 0 \quad .3a \quad a \quad 1.7a \quad 2a$$



1 (a) A curve has cartesian equation  $(x^2 + y^2)^2 = 3xy^2$ .

(i) Show that the polar equation of the curve is  $r = 3 \cos \theta \sin^2 \theta$ . [3]

(ii) Hence sketch the curve. [3]

$$r^2 = x^2 + y^2$$

$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$(x^2 + y^2)^2 = 3xy^2$$

$$(r^2)^2 = 3r \cos \theta r^2 \sin^2 \theta$$

$$\div r^3$$

$$\underline{r = 3 \cos \theta \sin^2 \theta}$$

$\theta$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	$\pi$
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$r$	0	1.1	0	-1.1	0
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