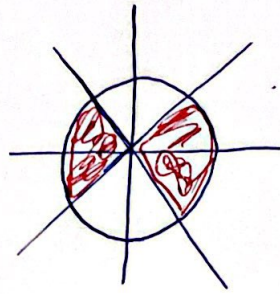


24]  $-\frac{\pi}{4} \leq \theta \leq \frac{\pi}{4}$   $-1 \leq r \leq 1$

11.3



37]  $r = \frac{5}{\sin\theta - 2\cos\theta}$

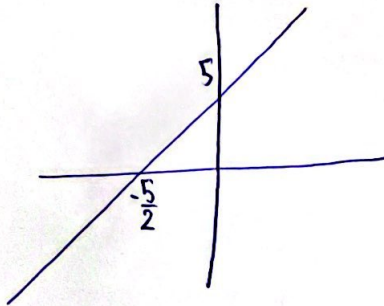
$r\sin\theta - 2r\cos\theta = 5$

$y - 2x = 5$

$y = 5 + 2x$

$m = 2$

$y = 0 \rightarrow x = -\frac{5}{2}$



60]  $xy = 2$

$r\cos\theta r\sin\theta = 2$

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

$r^2 \sin 2\theta = 4$

*Hayatun  
Shahadeh*

- 1) a.  $(3, 0) =$  e.  $(-3, \pi)$
- b.  $(-3, 0) =$  g.  $(-3, 2\pi)$
- c.  $(2, \frac{2\pi}{3}) =$  h.  $(-2, -\frac{\pi}{3})$
- d.  $(2, \frac{7\pi}{3}) =$  f.  $(2, \frac{\pi}{3})$

$$(r, \theta) \rightarrow \begin{aligned} x &= r \cos \theta \\ y &= r \sin \theta \end{aligned}$$

$$a. (\sqrt{2}, \frac{\pi}{4})$$

$$1) \quad x = \sqrt{2} \cos \frac{\pi}{4} = 1$$

$$(1, 1)$$

$$y = \sqrt{2} \sin \frac{\pi}{4} = 1$$

$$b. (1, 0)$$

$$x = 1 \cos 0 = 1 \quad (1, 0)$$

$$y = 1 \sin 0 = 0$$

$$c. (0, \frac{\pi}{2})$$

$$x = 0 \cos \frac{\pi}{2} = 0 \quad (0, 0)$$

$$y = 0 \sin \frac{\pi}{2} = 0$$

$$d. (-\sqrt{2}, \frac{\pi}{4})$$

$$x = -\sqrt{2} \cos \frac{\pi}{4} = -1 \quad (-1, -1)$$

$$y = -\sqrt{2} \sin \frac{\pi}{4} = -1$$

$$e. (-3, \frac{5\pi}{6})$$

$$x = -3 \cos \frac{5\pi}{6} = \frac{3\sqrt{3}}{2} \quad (\frac{3\sqrt{3}}{2}, -\frac{3}{2})$$

$$y = -3 \sin \frac{5\pi}{6} = -\frac{3}{2}$$

$$f. (5, \tan^{-1}(\frac{4}{3}))$$

$$x = 5 \cos(\tan^{-1} \frac{4}{3}) =$$

$$y = 5 \sin(\tan^{-1} \frac{4}{3}) =$$

$$\tan \theta = \frac{y}{x}$$

$$\tan^{-1}(\frac{y}{x}) = \theta$$

$$x = 3 \quad (3, 4)$$

$$y = 4$$

g.  $(-1, 7\pi)$

$$x = -1 \cos 7\pi = 1 \quad (1, 0)$$

$$y = -1 \sin 7\pi = 0$$

h.  $(2\sqrt{3}, \frac{2\pi}{3})$

$$x = 2\sqrt{3} \cos \frac{2\pi}{3} = -\sqrt{3} \quad (-\sqrt{3}, 3)$$

$$y = 2\sqrt{3} \sin \frac{2\pi}{3} = 3$$

7)  $0 \leq \theta < 2\pi \quad r \geq 0$

a.  $(1, 1)$

$$r^2 = 1+1$$

$$r^2 = 2$$

$$r = \sqrt{2}$$

$$\sin \theta = \frac{1}{\sqrt{2}} \rightarrow \theta = \frac{\pi}{4}$$

$$\begin{aligned} x &= r \cos \theta \\ y &= r \sin \theta \\ x^2 + y^2 &= r^2 \end{aligned}$$

$$(\sqrt{2}, \frac{\pi}{4})$$

b.  $(-3, 0)$

$$r^2 = 9+0$$

$$r = 3$$

$$\begin{aligned} \sin \theta &= 0 \\ \cos \theta &= -1 \end{aligned} \rightarrow \theta = \pi$$

$$(3, \pi)$$

c.  $(-\sqrt{3}, -1)$

$$r^2 = 3+1$$

$$r^2 = 4$$

$$r = 2$$

$$\begin{aligned} \sin \theta &= -\frac{1}{2} \\ \cos \theta &= -\frac{\sqrt{3}}{2} \end{aligned} \rightarrow \theta = \frac{11\pi}{6}$$

$$(2, \frac{11\pi}{6})$$

$(-3, 4)$

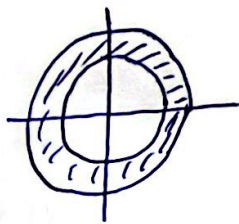
$$r^2 = 9 + 16$$

$$r = 5$$

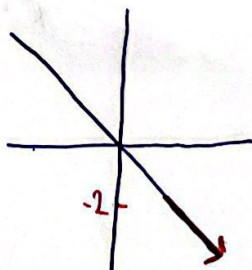
$$\left. \begin{array}{l} \sin \theta = \frac{4}{5} \\ \cos \theta = \frac{-3}{5} \end{array} \right\} \theta = \pi - \tan^{-1}\left(\frac{4}{3}\right)$$

$$\left(5, \pi - \tan^{-1}\left(\frac{4}{3}\right)\right)$$

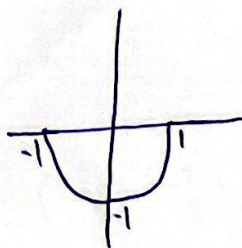
14)  $1 \leq r \leq 2$



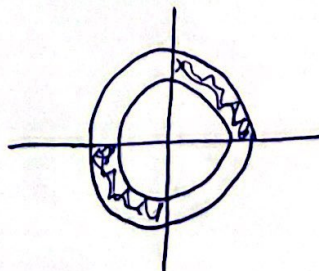
16)  $\theta = \frac{2\pi}{3}$        $r \leq -2$



22)  $0 \leq \theta \leq \pi$ ,  $r = -1$



20)  $0 \leq \theta \leq \frac{\pi}{2}$        $1 \leq |r| \leq 2$

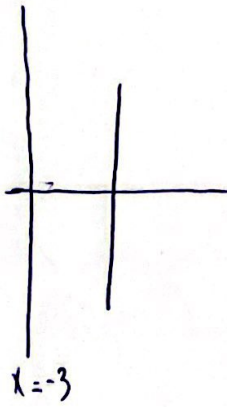


32)  $r = -3 \sec \theta$

$r = \frac{-3}{\cos \theta}$

$r \cos \theta = -3$

$x = -3$



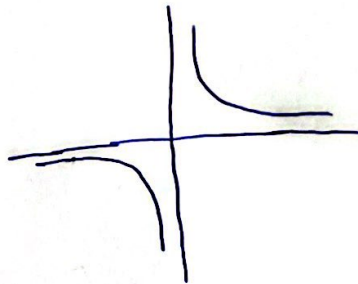
38)  $r^2 \sin 2\theta = 2$

$2 r^2 \cos \theta \sin \theta = 2$

$r \cos \theta r \sin \theta = 1$

$yx = 1$

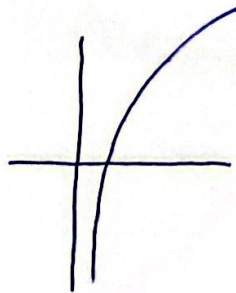
$y = \frac{1}{x}$



42)  $r \sin \theta = \ln r + \ln \cos \theta$

$y = \ln r \cos \theta$

$y = \ln x$



52)  $r \sin \left( \frac{2\pi}{3} - \theta \right) = 5$

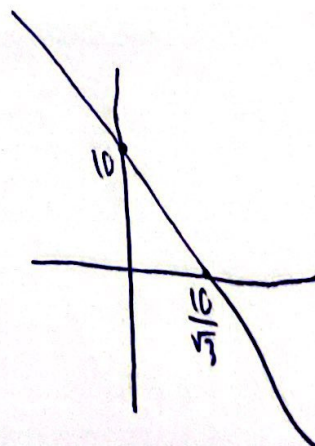
$r \left( \sin \left( \frac{2\pi}{3} \right) \cos \theta - \sin \theta \cos \left( \frac{2\pi}{3} \right) \right) = 5$

$r \left( \frac{\sqrt{3}}{2} \cos \theta + \frac{1}{2} \sin \theta \right) = 5$

$\frac{\sqrt{3}}{2} r \cos \theta + \frac{1}{2} r \sin \theta = 5$

$\frac{\sqrt{3}}{2} x + \frac{1}{2} y = 5$

$y = 10 - \sqrt{3}x$



$$(2) \quad x^2 + xy + y^2 = 1$$

$$r^2 + r \cos \theta r \sin \theta = 1$$

$$r^2 + r^2 \cos \theta \sin \theta = 1$$

$$r^2 [1 + \cos \theta \sin \theta] = 1$$

$$r^2 \left[ 1 + \frac{1}{2} \sin 2\theta \right] = 1$$