In each case of the function given in polar coordinates, convert the equation in rectangular coordinates and graph the equation.

1.) $\theta = \frac{\pi}{3}$

2.) $r = 3$

3.) $r = 2\sin\theta$

4.) $r = 3\cos\theta$

5.) $r = 1 + 2\cos\theta$

6.) $r = 1 + \cos\theta$

7.) $r = \cos 2\theta$

8.) $r = \sin 2\theta$

9.) $r = \cos 3\theta$

10.) $r = \sin 3\theta$

11.) $r = \sin\theta + \cos\theta$

12.) $r = \theta$

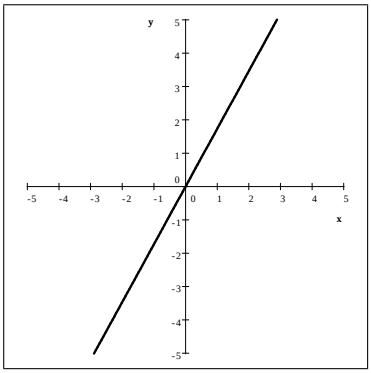
Answers

In each case of the function given in polar coordinates,

a) convert the equation in rectangular coordinates b) graph the equation.

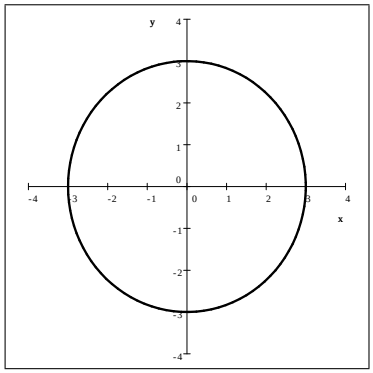
1.) $\theta = \dfrac{\pi}{3}$

$y = \sqrt{3}x$



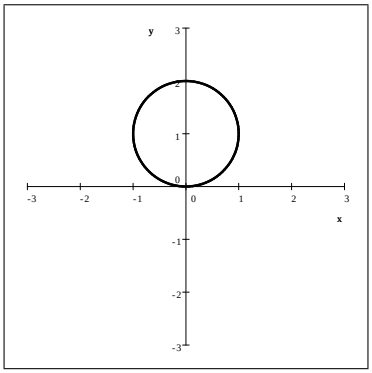
2.) $r = 3$

$x^2 + y^2 = 9$



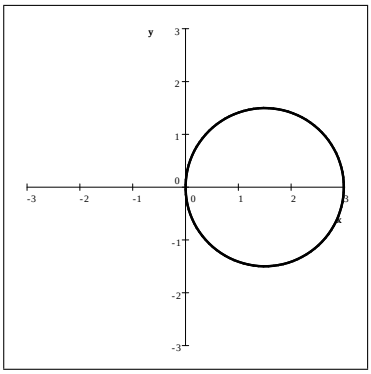
3.) $r = 2\sin\theta$

$x^2 + (y-1)^2 = 1$



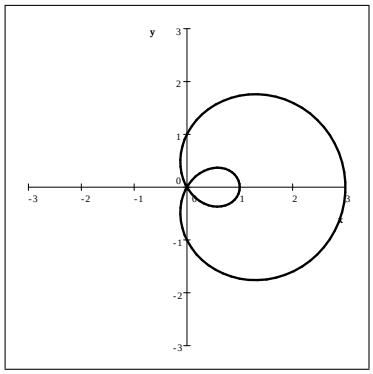
4.) $r = 3\cos\theta$

a) $\left(x - \dfrac{3}{2}\right)^2 + y^2 = \dfrac{9}{4}$



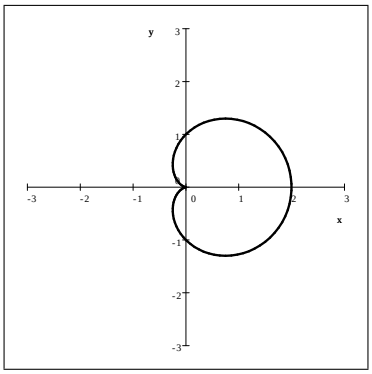
5.) $r = 1 + 2\cos\theta$

$(x^2 + y^2 - 2x)^2 = x^2 + y^2$



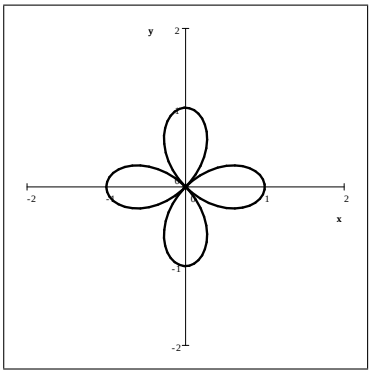
6.) $r = 1 + \cos\theta$

$(x^2 + y^2 - x)^2 = x^2 + y^2$



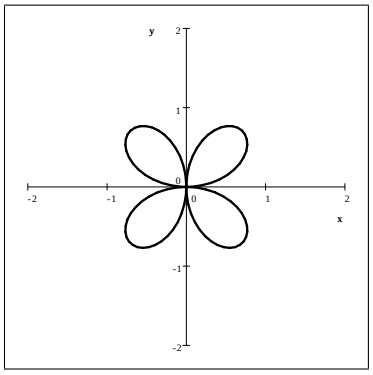
7.) $r = \cos 2\theta$

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

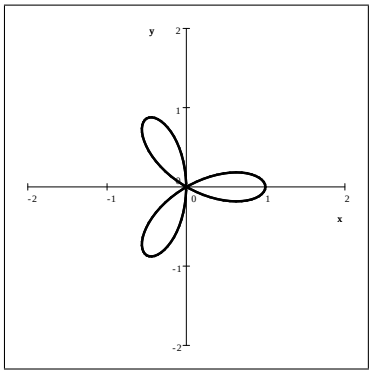


8.) $r = \sin 2\theta$

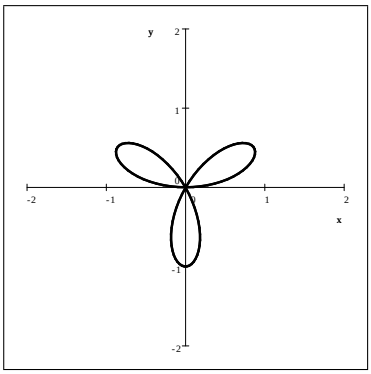
$(x^2 + y^2)^3 = 4x^2y^2$



9.) $r = \cos 3\theta$

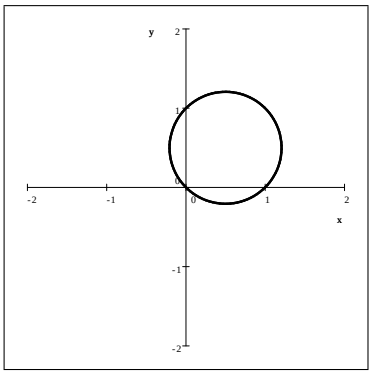


10.) $r = \sin 3\theta$



11.) $r = \sin\theta + \cos\theta$

$$\left(x - \frac{1}{2}\right)^2 + \left(y - \frac{1}{2}\right)^2 = \frac{1}{2}$$



12.) $r = \theta$

$$\tan\left(\sqrt{x^2 + y^2}\right) = \left(\frac{y}{x}\right)$$