

Answer on Question 48332, Math, Calculus

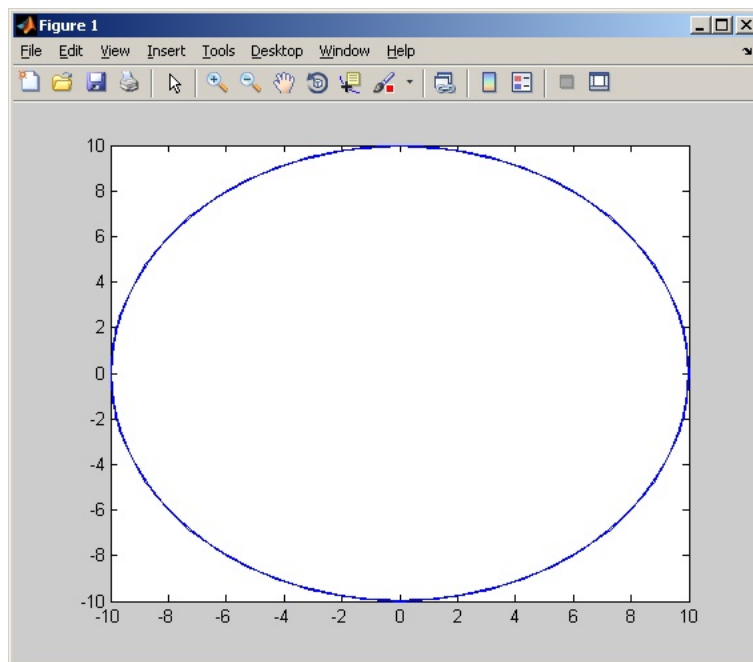
Trace the curve

$$x = a \cos 3\theta, y = a \sin 3\theta$$

Consider $\theta \in [-\pi, \pi]$. Then we use MATLAB R2014a to plot this curve

Listing 1: q48332.m

```
1 a=10;  
2 theta=-pi:2*pi/100:pi;  
3 x=a*cos(3*theta);  
4 y=a*sin(3*theta);  
5 plot(x,y)
```



Of course, we could guess it was a circle if we used trigonometry:

$$x^2(t) + y^2(t) = a^2(\cos^2 3\theta + \sin^2 3\theta) = a^2$$

This means that this curve is a arc of a circle, dependent on what values of θ we consider.