1.6 Polar Curves

The `matplotlib.pyplot.polar()` function in pyplot module of matplotlib python library is used to plot the curves in polar coordinates.

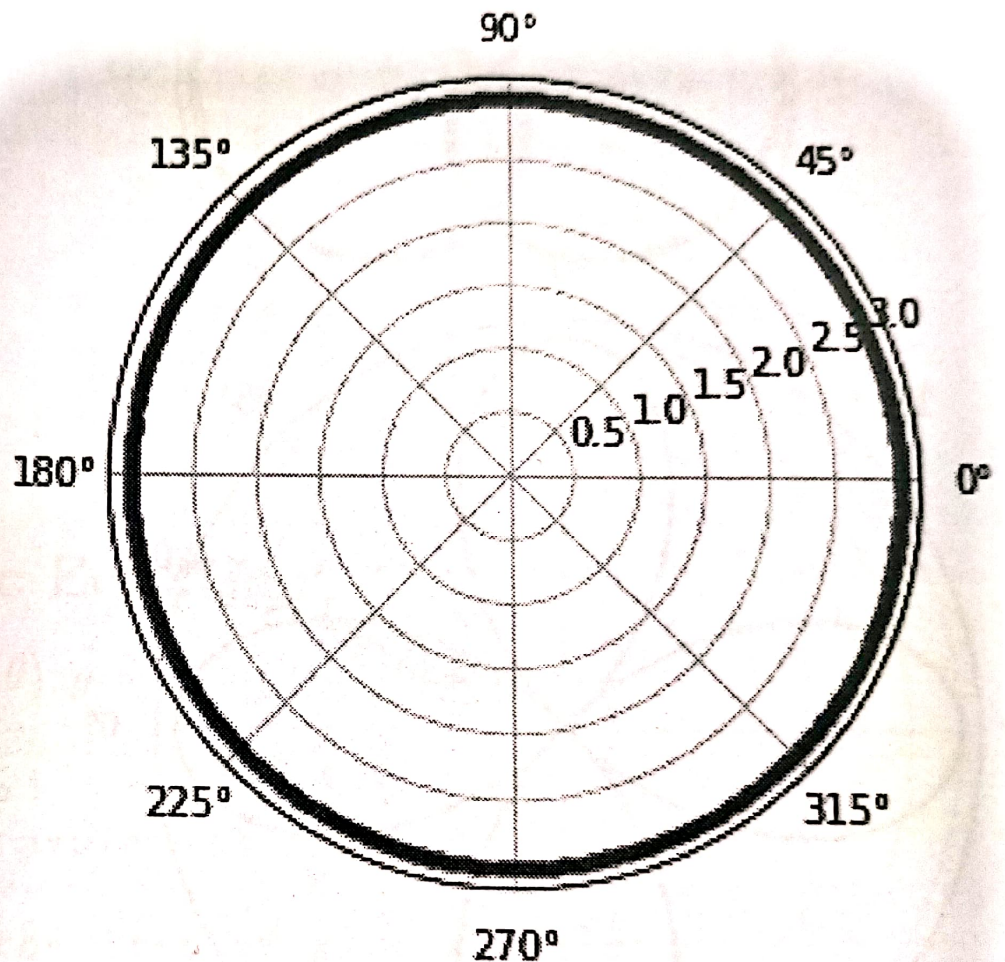Syntax:

```
matplotlib.pyplot.polar(theta, r, **kwargs)
```

- Theta: This is the angle at which we want to draw the curve.

- r: It is the distance.

1. Circle: $r = p$, Where p is the radius of the circle

```
import numpy as np
import matplotlib.pyplot as plt

plt.axes(projection = 'polar')
r = 3
rads = np.arange(0, (2 * np.pi), 0.01)
```

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```
# plotting the circle
for i in rads:
    plt.polar(i, r, 'g.')
plt.show()
```
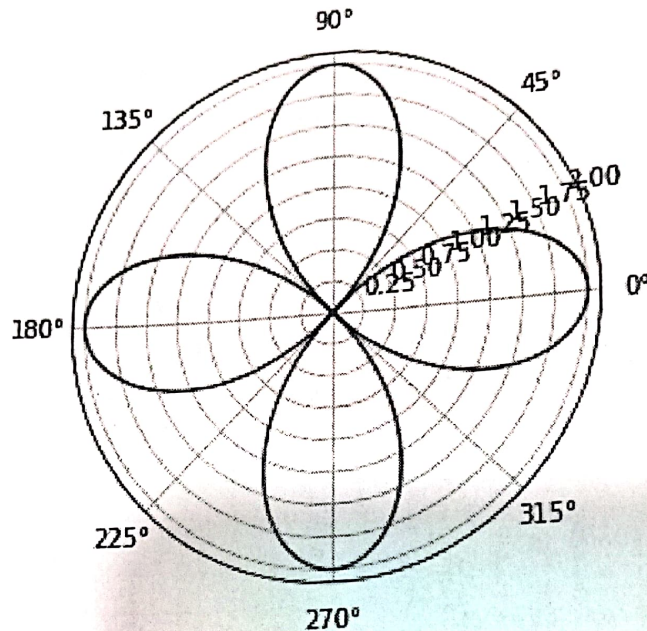

3. Cardioid: $r = 5(1 + cos\theta)$

```
#Plot cardioid r=5(1+cos theta)
from pylab import *
theta=linspace(0,2*np.pi,1000)
r1=5+5*cos(theta)

polar(theta,r1,'r')
show()
```

90°

4. Four leaved Rose: $r = 2|\cos 2x|$

```
#Plot Four Leaved Rose r=2 |cos2x|
from pylab import *
theta=linspace(0,2*pi,1000)
r=2*abs(cos(2*theta))
polar(theta,r,'r')
show()
```


5. Cardioids: $r = a + a\cos(\theta)$ and $r = a - a\cos(\theta)$

```
import numpy as np
import matplotlib.pyplot as plt
import math

plt.axes(projection = 'polar')
a=3

rad = np.arange(0, (2 * np.pi), 0.01)
# plotting the cardioid
for i in rad:
    r = a + (a*np.cos(i))
    plt.polar(i,r,'g.')
    r1=a-(a*np.cos(i))
    plt.polar(i,r1,'r.')
# display the polar plot
plt.show()
```