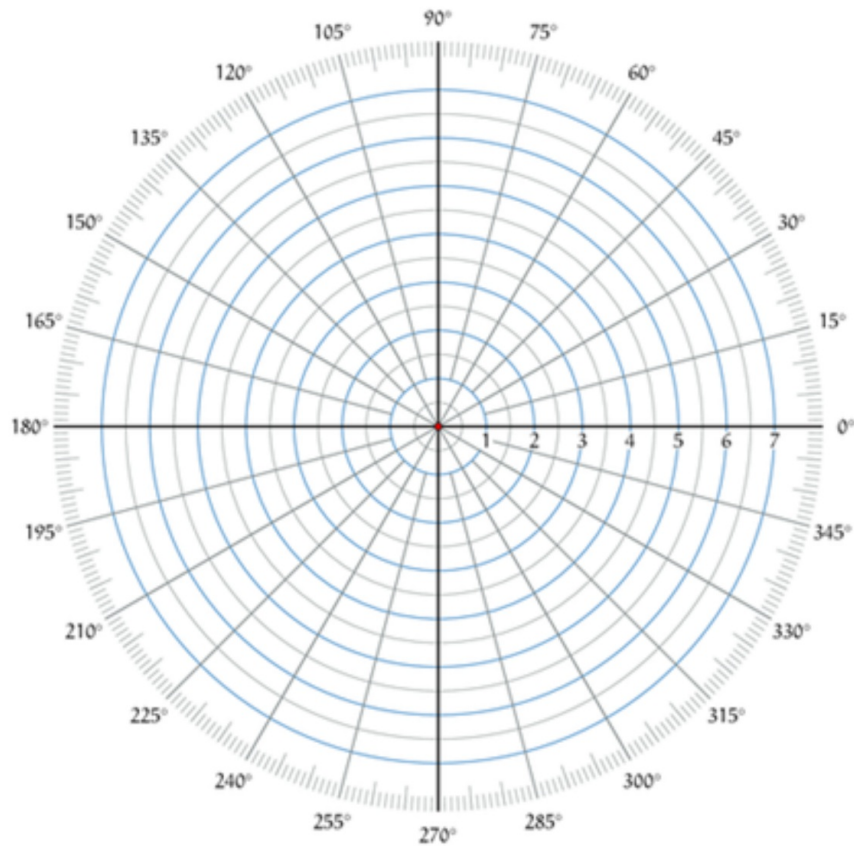


Warm - Up

Find the max and min are can be for the following polar equation:

$$r = 4\cos(t)$$
$$r = 4\cos(t)$$
[illegible]



Equations of Circles

$$r = a \sin(\theta)$$

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

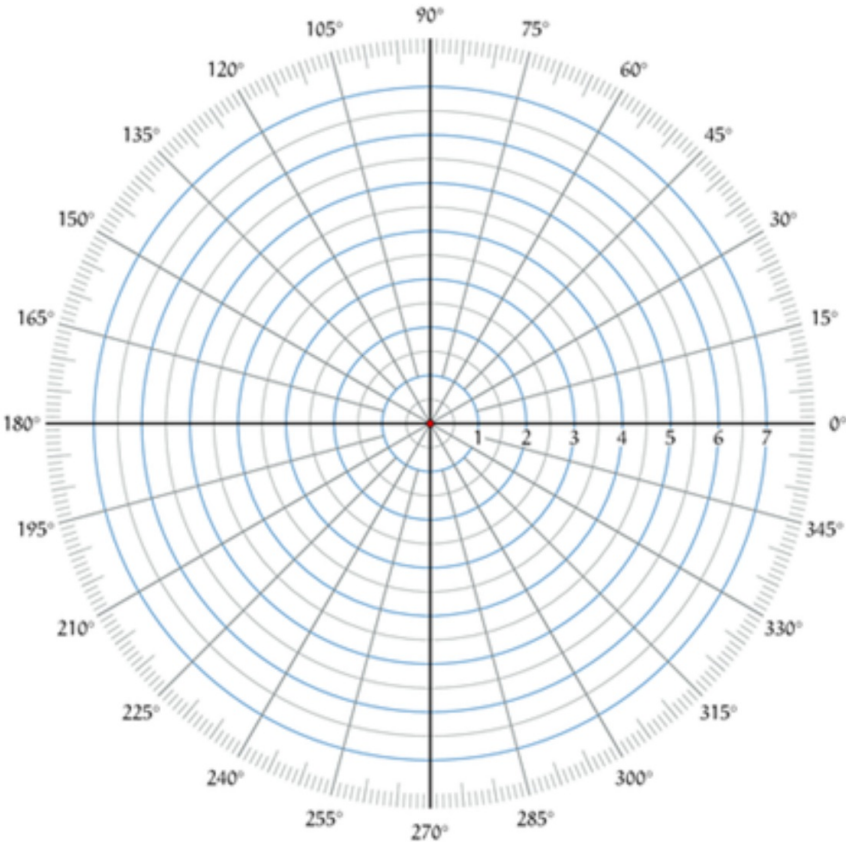
These are circles with center along either the x axis (cosine) or y axis (sine)

$$r = a$$

Is a cricle with center at the origin and radius of a.

Graph $r = 2 + 3\cos(t)$

t	R



Equations of Limacons

$$r = a \pm b\cos(\theta)$$

$$r = a \pm b\sin(\theta)$$

If $|a/b| < 1$ the graph of the limaçon has an inner loop.

If $1 < |a/b| < 2$ the graph of the limaçon is dimpled

If $|a/b| \geq 2$ the graph of the limaçon is considered convex

Limaçon with inner loop: $r = 2 + 3\cos(t)$

Limacon with inner loop quick cheat:

- 1) The inner loop has a length of $b - a$
- 2) The outer loop has a length of $a + b$

Limacon with a dimple: $r = 3 + 2\sin(t)$

Limacon to be convex: $r = 8 + 2\cos(t)$

Equations of Cardioids (Happy Late Valentines!)

Graph $r = 2 - 2\cos\theta$

$$r = a \pm b \cos \theta$$

$$r = a \pm b \sin \theta$$

are cardioids only if $|a/b| = 1$

Equations of Rose Curves

Graph $r = 2 \sin(3t)$

Equations of Rose Curves

$$r = a \sin(n\theta)$$

$$r = a \cos(n\theta)$$

When n is odd, there are n pedals

When n is even, there are $2n$ pedals