

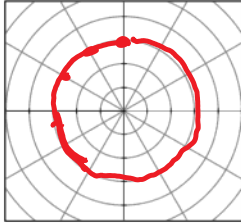
Day 12 Notes

Monday, March 9, 2015 2:40 PM

Precalculus
6.5 Day 1 - Graphing Circles and Cardioids

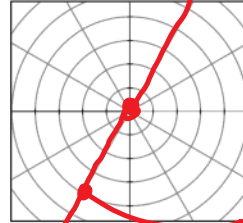
(r, θ)

1) Graph $R = 3$

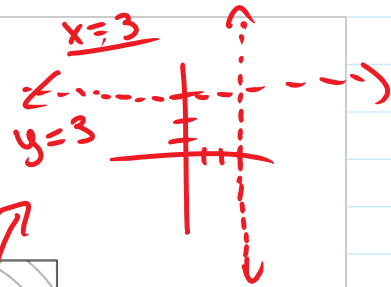


What shape does the graph hold?

2) Graph $\theta = \frac{\pi}{3}$



What shape does the graph hold?

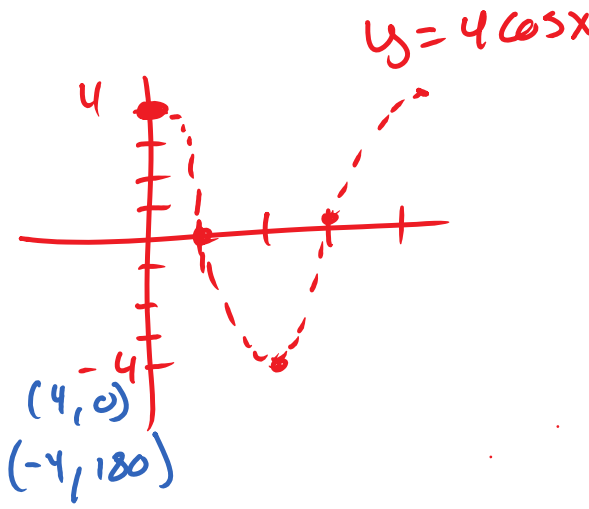
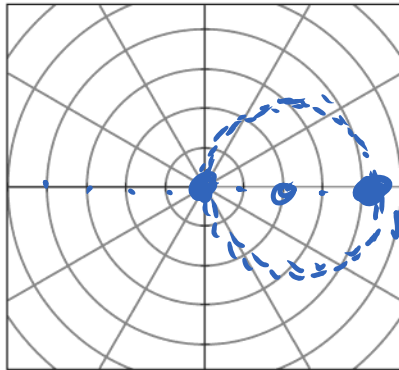


$x=3$

$y=3$

$(-4, \frac{\pi}{3})$

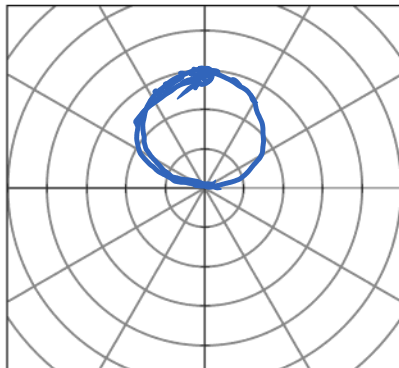
3) Graph $r = 4 \cos \theta$



$y = 4 \cos x$

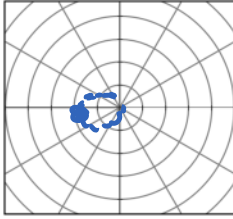
$(4, 0)$
 $(-4, 180)$

4) Graph $r = 3 \sin \theta$

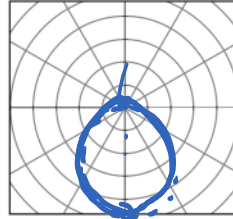


Use your calculators to graph the following. Then sketch the graph below.

a. $r = -2\cos\theta$



b. $r = -5\sin\theta$



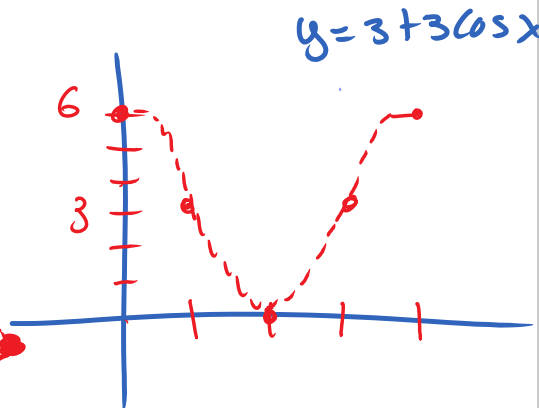
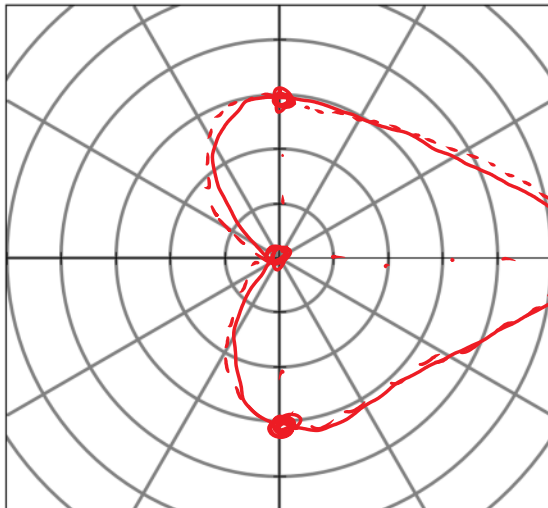
What observations can you make?

- The circle will lie on the "x" axis if it has a cosine in its equation.
- The circle will lie on the "y" axis if it has a sine in its equation.
- Multiplying by a constant increases the size of the Diameter of the circle.
- Multiplying by a negative reflect the circle across an axis.

Circle: $r = a\sin\theta$ or $r = a\cos\theta$

Let's Move On ...

Graph this equation $r = 3 + 3\cos\theta$



$\theta =$

The name of this polar equation is a

Cardioids

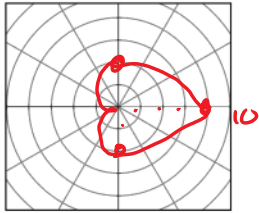
Its shape resembles a heart!

Its general form is

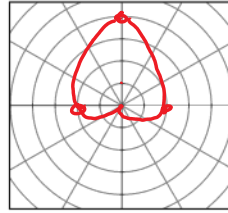
$$r = a \pm a\cos\theta \text{ or } r = a \pm a\sin\theta$$

Use your calculators to graph the following. Then sketch the graph below.

1. $r = 4 + 4\cos\theta$



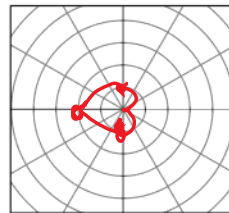
2. $r = 2 + 2\sin\theta$



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



4. $r = 1 - \cos\theta$



What observations can you make?

- The cardioid follows the same rules as the circle does in terms of which axis it lies on....

Positive cosine \implies + X axis \leftarrow "point"

Negative cosine \implies - X axis

Positive sine \implies + Y axis

Negative sine \implies - Y axis

- The length of the cardioid can be found by

$$\frac{2 \cdot a}{}$$

- The intercepts of the cardioid can be found

$$\pm a$$