Accelerated Pre-Calculus

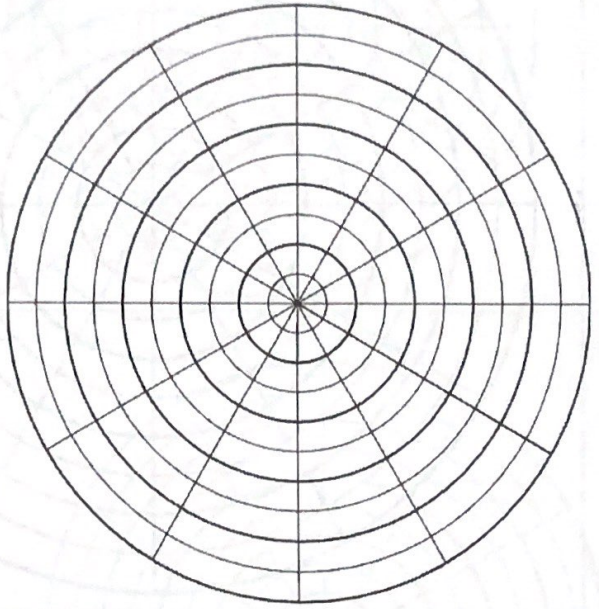
Name(s)_____

Investigation of Common Polar Graphs

The general formula for each curve is given. Using your graphing calculator, experiment with different values a, b and n and then make conjectures based on your experimentations.

LIMACON

General Formula(s):	What values of *a* and *b* make it…	An example of one…
$r = a \pm b\cos\theta$ $r = a \pm b\sin\theta$	**Looped:** **Dimpled:** **Convex:**	**Equation:**



Write at least 3 different equations for a LIMACON and identify if they are horizontal or vertical and whether they are Looped, Dimpled, or Convex. Check them on your graphing calculator.

CARDIOD

General Formula(s):

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

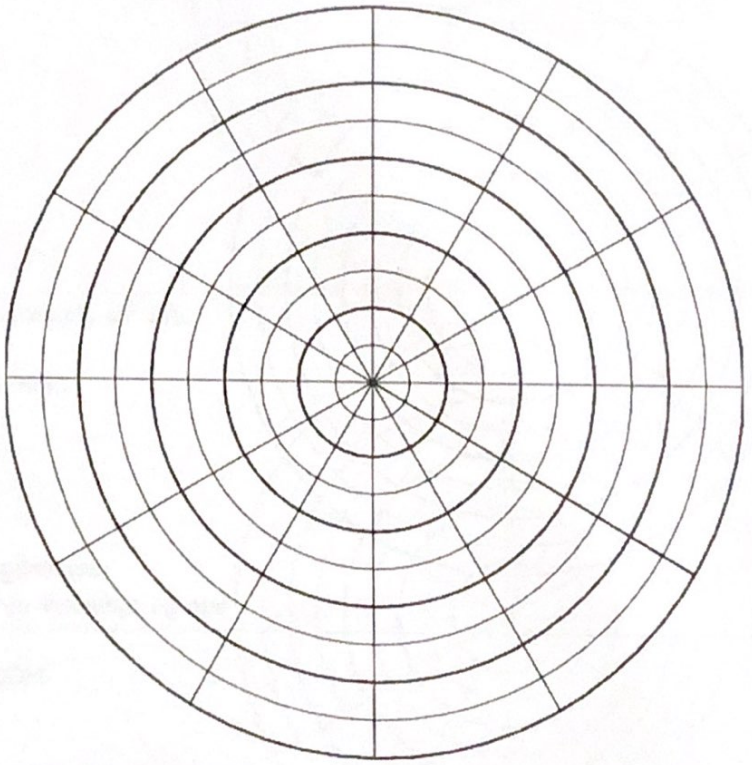
$$r = a \pm b\sin\theta$$

It is a special case of a

Limacon.

An example of one...

Equation:



What values of a and b create a cardiod?

Write at least 2 different equations for a CARDIOD and identify if they are horizontal or vertical. Check them on your graphing calculator.

ROSE CURVES

General Formula(s):

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

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

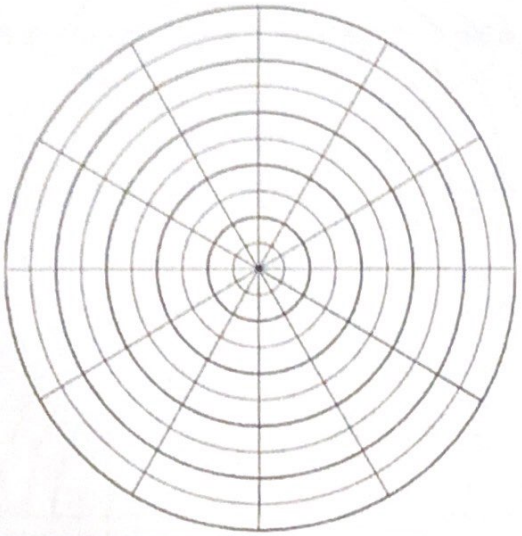
Description:
(Address the difference between a sin/cos rose curve)

If n is odd...

If n is even...

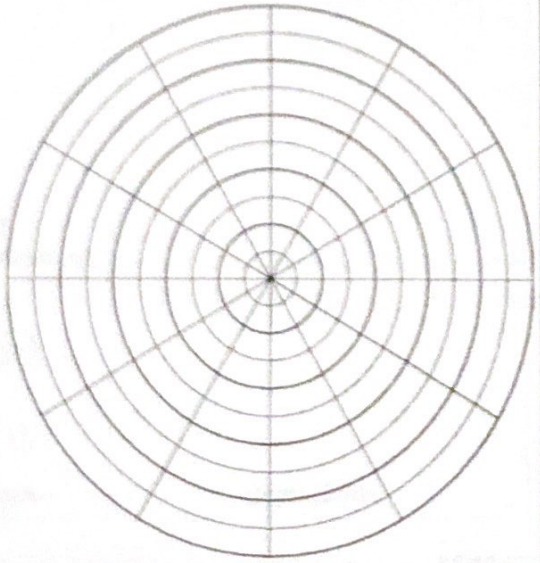
An example of one...

Equation:



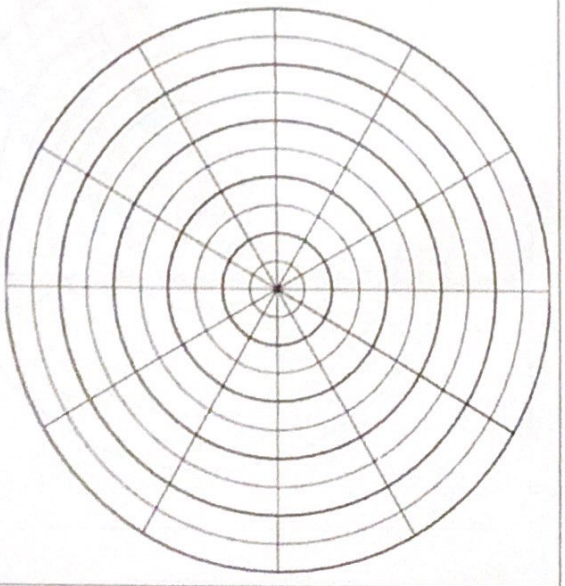
An example of one...

Equation:



An example of one...

Equation:



LEMNISCATE

General Formula in Polar:

$$r^2 = a^2 \sin 2\theta$$

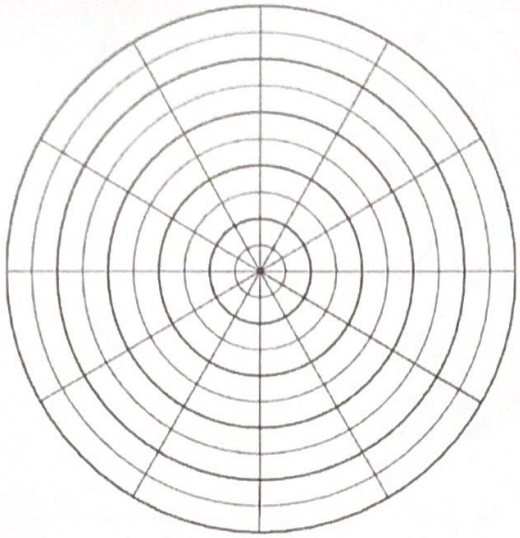
$$r^2 = a^2 \cos 2\theta$$

How does changing the value of a change the graph?

Description:

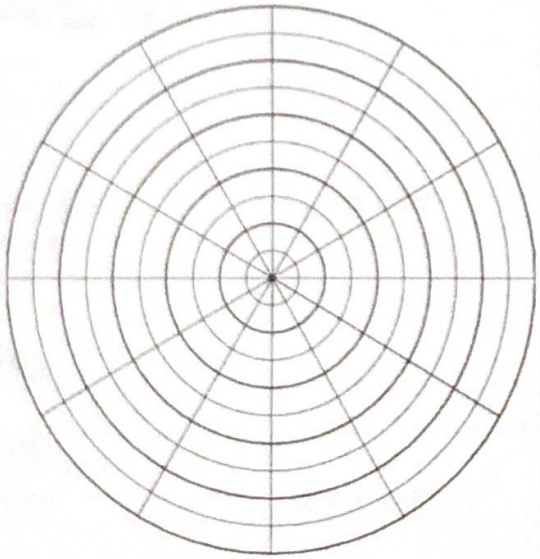
An example of one...

Equation:



An example of one...

Equation:



An example of one...

Equation: