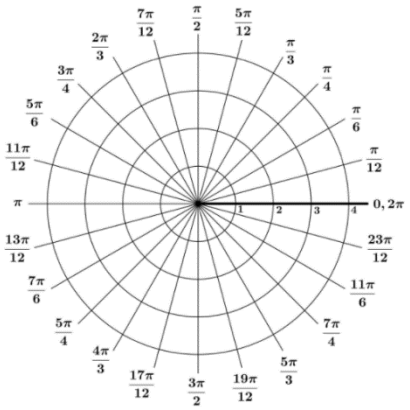
Name:_____

Polar and Parametric Test Review

Part 1: Polar (all non-calculator)

Plot the coordinates and convert from polar coordinates to rectangular coordinates

1. $A\left(3,\frac{7\pi}{6}\right)$



2. $B\left(-2,\frac{3\pi}{4}\right)$

3. $C\left(1,-\frac{2\pi}{3}\right)$

4. $D(-3,0)$

Convert from rectangular coordinate to polar coordinates

5. $(2,-2)$ 6. $\left(3,3\sqrt{3}\right)$ 7. $(0,-4)$

Convert the equation from rectangular to polar

8. $x^2+y^2=25$ 9. $y=2$

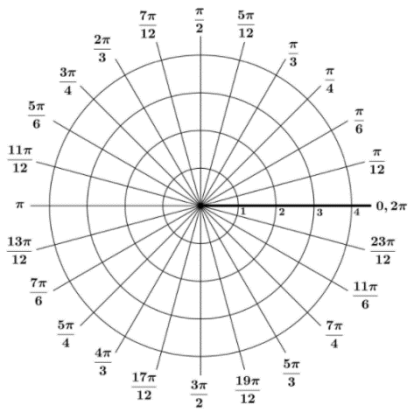
Convert the equation from polar to rectangular

10. $r\cos\theta=4$ 11. $r=4\sin\theta$

Write the type of graph, make a table, and draw the graph

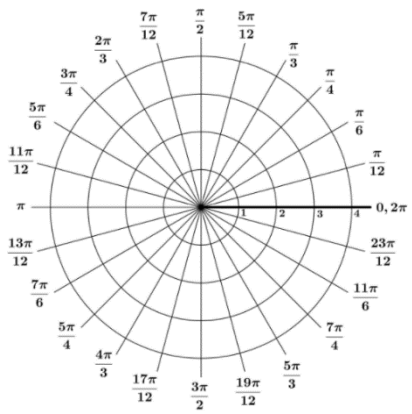
12. $r=2+2\sin\theta$

Type:



13. $r=1-3\cos\theta$

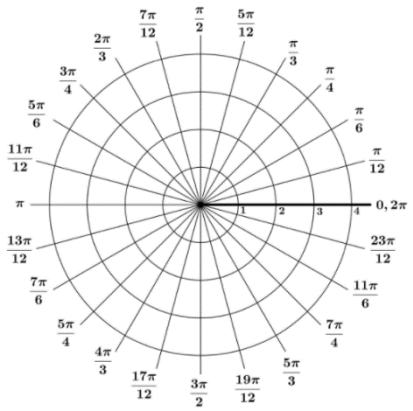
Type:



Write the type of graph, make a table, and draw the graph

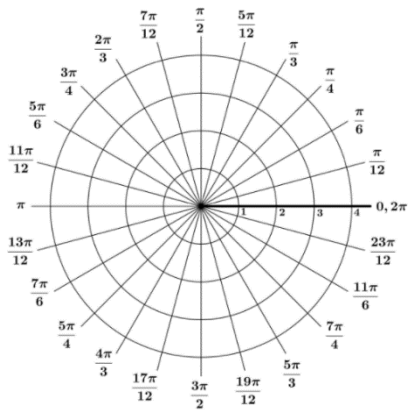
14. $r = 3 - 2\sin\theta$

Type:



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

Type:



15. Describe the difference between the graph of $r = 2\sin 3\theta$ and $r = 3\sin 2\theta$

Part 2: Parametric (non-calculator)

Graph the parametric equations (show direction with arrows) and eliminate the parameter to find a rectangular equation

1. $\begin{aligned} x &= 2t + 3 \\ y &= -t + 1 \end{aligned}$

2. $\begin{aligned} x &= t^2 - 1 \\ y &= t^2 + 1 \end{aligned}$ $1 \le t \le 3$

3. $\begin{aligned} x &= 1 - t^2 \\ y &= 1 + t \end{aligned}$

4. $\begin{aligned} x &= 5\cos(t) + 1 \\ y &= 5\sin(t) - 3 \end{aligned}$

5. $\begin{aligned} x &= 5\sin(t) \\ y &= 3\cos(t) \end{aligned}$ $0 \le t \le \pi$

6. $\begin{aligned} x &= \cos(-t) \\ y &= \sin(-t) \end{aligned}$ $0 \le t \le \pi$

Write a set of parametric equations to model the following situations

7. An ellipse, centered at the origin, with end points (0,-2), (0,2), (-3,0), (3,0) that rotates *clockwise*

8. A circle centered at (2,3) with a radius of 4 that rotates *counter-clockwise*

9. A wall 300 feet away that is 20 ft tall with

a) t-max 10 b)t-max 2 c)t-max 5

10. A cannon shoots a ball from 5 feet off the ground at an initial velocity of 200 ft/sec at an angle of 39°, with a breeze blowing with the ball at 5 ft/sec

Part 3 Parametric-Calculator

11. A long jumper leaves the ground with an initial velocity of 31 ft/sec at an angle of 22-degrees. Determine the time of flight, the horizontal distance traveled, and the peak height of the long-jumper.

12. A football is kicked with an initial velocity of 44 ft/s at an angle of 55-degrees. If the cross bar of the goal post is 10 feet high and 45 feet away, will the kick be good? What if the wind was blowing in at 3 ft/s?

13. A baseball player hits a ball with an initial velocity of 130 ft/sec. There is a wind blowing with the ball at 3 ft/sec. The angle of elevation of the ball off the bat is 25° and the ball hits the bat 2 ft off the ground. Give the set of parametric equations for the path of the ball. At what time is the ball 200 ft away? Will the ball clear a 10 ft high fence 400 ft away?