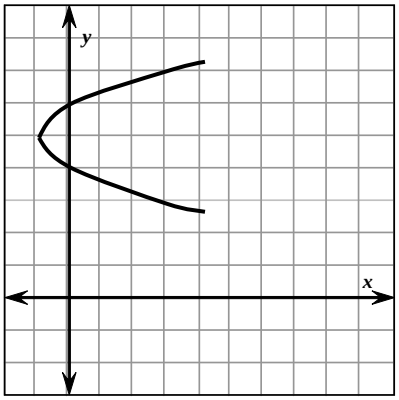
Eliminate the parameter to write the corresponding rectangular equation. Be able to graph these:

1) $x = t^2 - 4t + 3$
$y = t + 3$

$t = y - 3$ so

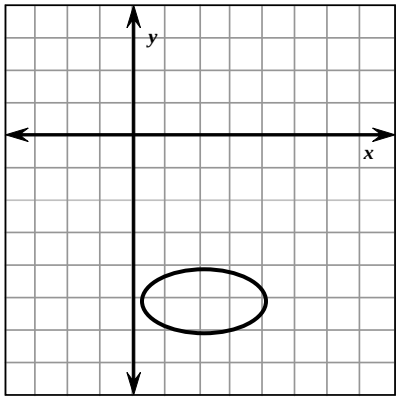
$x = (y - 3)^2 - 4(y - 3) + 3$



2) $x = 2\cos\theta + 2$
$y = \sin\theta - 5$

$\left(\frac{x-2}{2}\right) = \cos\theta$, $y + 5 = \sin\theta$

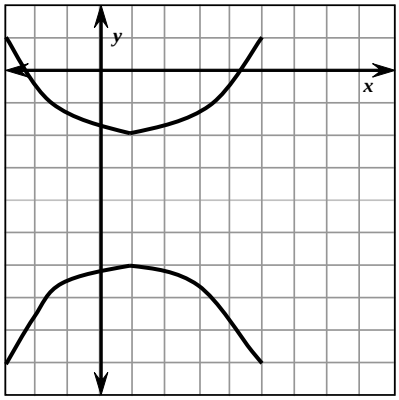
$\left(\frac{x-2}{2}\right)^2 + (y+5)^2 = 1$



3) $x = 3\tan\theta + 1$
$y = 2\sec\theta - 4$

$\left(\frac{y+4}{2}\right) = \sec\theta$, $\left(\frac{x-1}{3}\right) = \tan\theta$

$\left(\frac{y+4}{4}\right)^2 - \left(\frac{x-1}{9}\right)^2 = 1$



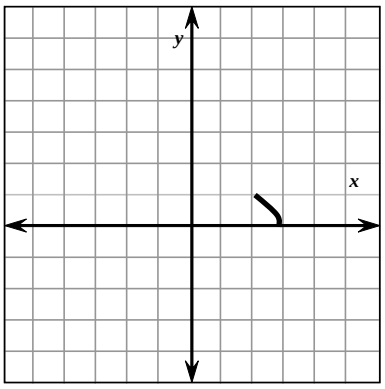
4. Using the parametric equations $\begin{cases} x = \cos\theta + 2 \\ y = \sin^2\theta \end{cases}$

A. Complete a table:

θ	$-\frac{\pi}{2}$	$-\frac{\pi}{4}$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$
x	2	$\frac{\sqrt{2}}{2} + 2$	3	$\frac{\sqrt{2}}{2} + 2$	2
y	1	$\frac{1}{2}$	0	$\frac{1}{2}$	1

Arrows will show direction !

B. Plot the points (x, y) from the table to graph the parametric equations. (Use arrows to show the direction.



5. Find two different sets of parametric equations for $y = -7x^4 - 2x^2 + 5$

A. $x = t$
$y = -7t^4 - 2t^2 + 5$

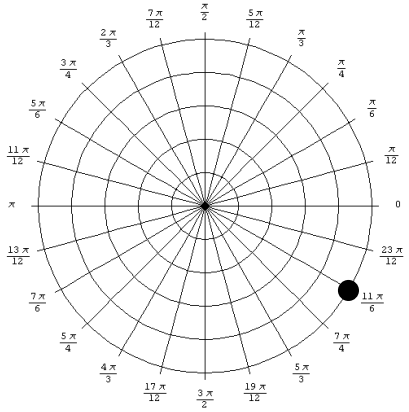
B. $x = t + 1$
$y = -7(t + 1)^4 - 2(t + 1)^2 + 5$

6. $\left(5, -\frac{\pi}{6}\right)$ **A. Plot the given point on a polar graph.**

B. Find four additional polar coordinates for the point $0 \le \theta \le 2\pi$.

C. Find the corresponding rectangular coordinates for the point.

A.



B.

$\left(5, \frac{11\pi}{6}\right)$

$\left(-5, \frac{5\pi}{6}\right)$

$\left(-5, -\frac{7\pi}{6}\right)$

C.

$\left(\frac{5\sqrt{3}}{2}, -\frac{5}{2}\right)$

Rectangular coordinates of a point are given. Find the polar coordinates.

7. $(-2\sqrt{2}, -2\sqrt{2})$

$\left(4, \frac{5\pi}{4}\right)$

8. (-3, 0)

$(3, \pi)$

Convert the rectangular equation to polar form.

9. $x^2 + y^2 = 81$

r = 9

10. $4x - 2y + 5 = 0$

$4r\cos\theta - 2r\sin\theta = -5$

$r = \frac{-5}{4\cos\theta - 2\sin\theta}$

Convert the polar equation to rectangular equation in rectangular form.

11. $r = \frac{1}{5 - \cos\theta}$

$5\sqrt{x^2 + y^2} - x = 1$

12. $\theta = \frac{3\pi}{4}$

y = -x

Write the equation of the following polar graphs:
13. Limacon: _____
14. Lemniscate: _____
15. Rose: _____
16. Circle: _____

Name the polar graph that results from the following equations:
16. $r = 3 + 3\cos\theta$ _____ cardioid
17. $r = 4\sin\theta$ _____ circle with radius 2
18. $r = 1 + 2\sin\theta$ _____ inner loop limacon
19. $r = 2 + \cos\theta$ _____ convex limacon

Sketch 16 – 19.

Make sure you know how to find a maximum, zeros, and symmetry.