Unit #4: Parametrics and Polars
Topic: Parametrics and Polars Review
Objective: *SWBAT solve various problems with parametrics and polars.*

CALCULATOR ALLOWED
Directions: Read each question carefully and show all work.
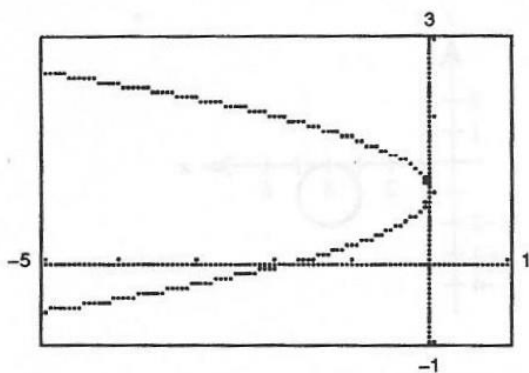
1) Eliminate the parameter and find a corresponding rectangular equation:

   a) $x = 5 - 3t, \ y = -4 + 9t$
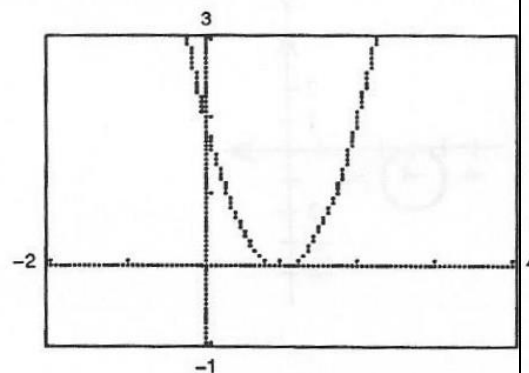
   b) $x = -5\cos t, \ y = 5\sin t$

2) Which of the following is the curve for the parametric equations $x = 2t^2$ and $y = t + 1$?
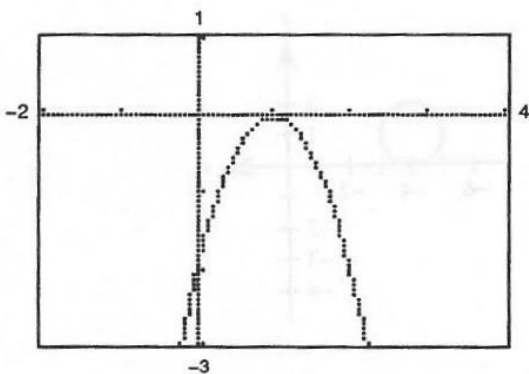
   a)
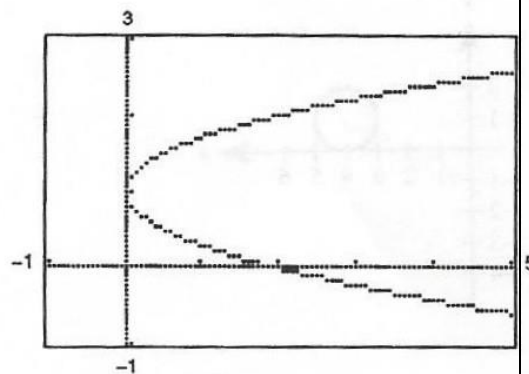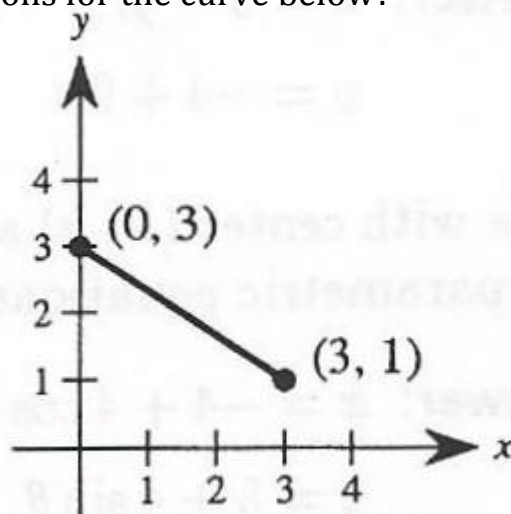

   b)

   c)

   d)

3) Which of the following are a set of parametric equations for the curve below?

a) $x = \frac{3}{2}t$

   $y = t + 3$

b) $x = t$

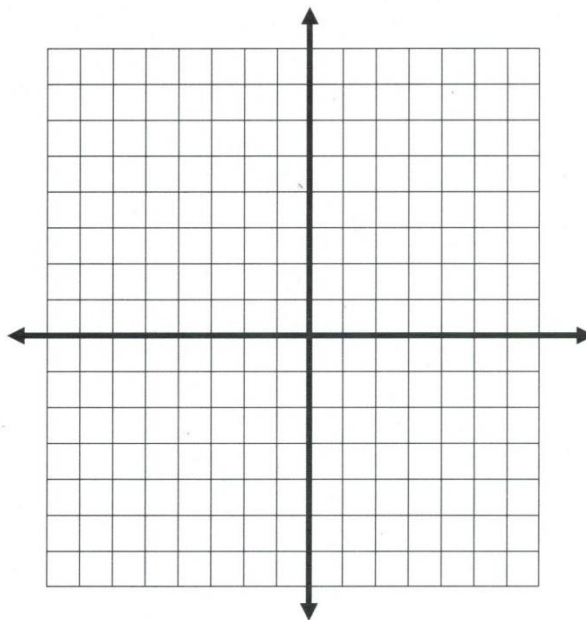 $y = -\frac{2}{3}t + 3$

c) $x = -\frac{3}{2}t$

   $y = t - 3$

d) $x = t$

   $y = \frac{2}{3}t + 3$

4) Graph the pair of parametric equations by creating a table of values, indicate the direction of the graph, and then eliminate the parameter.

$$x = 2t - 1, \ y = t^2 + 4, -2 \leq t \leq 2$$

5) Convert from polar to rectangular coordinates:

a) $\left(3, \frac{5\pi}{3}\right)$

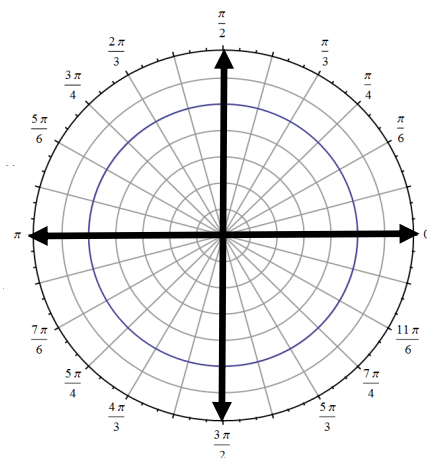b) $\left(-6, \frac{3\pi}{2}\right)$

6) Convert from rectangular to polar coordinates:
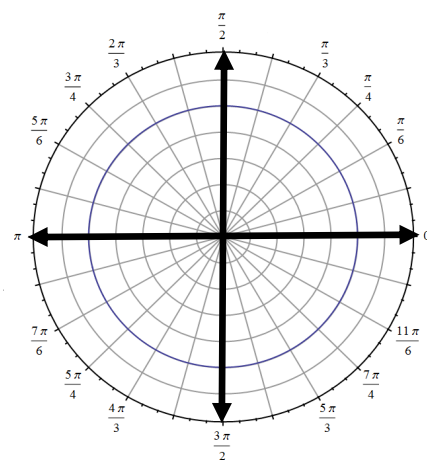
   a) $\left(-1, -\sqrt{3}\right)$

   b) $(0, -4)$

7) Plot the point whose polar coordinates are given below and then find three additional representations for each of them.
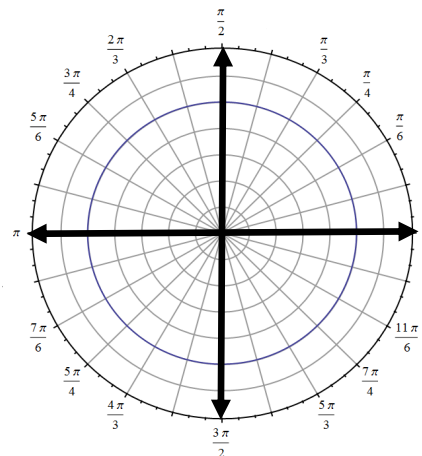
   a) $\left(2, -\dfrac{2\pi}{3}\right)$
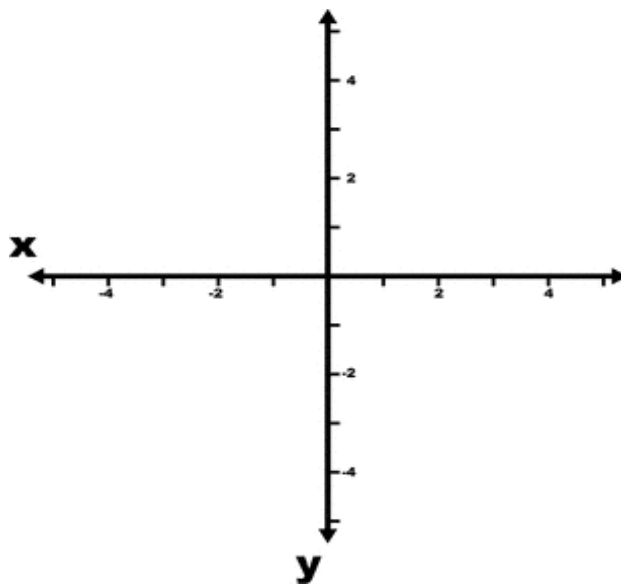

   b) $\left(-2, \dfrac{5\pi}{6}\right)$
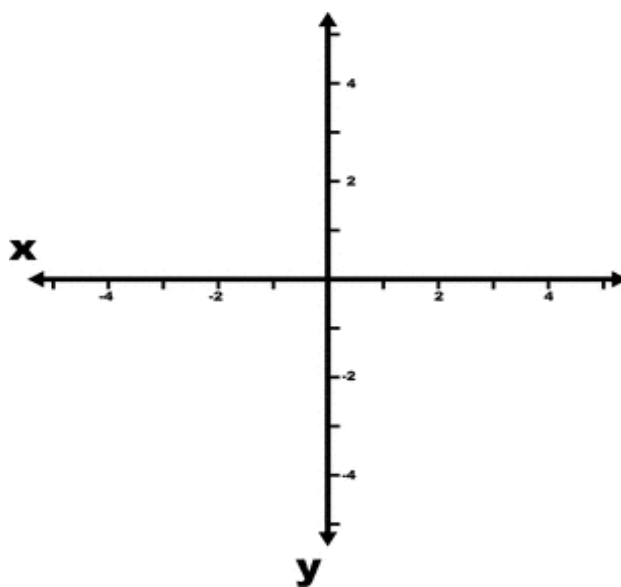
c) $\left(3, \dfrac{\pi}{4}\right)$

8) Determine two pairs of polar coordinates given the rectangular point (3,-3).

9) Where do the graphs of $r = 4\sqrt{3}$ and $r = -8sin\theta$ intersect?

10) Graph the equation $r = 7\cos 2\theta$ and identify the zeroes and maxima.

11) Graph the equation $r = 1 - 2\sin\theta$ and identify the zeroes and maxima.

12) Graph the following pair of equations and then find the point(s) of intersection.

$$r = -2\cos\theta \quad and \quad r = 2 + 2\cos\theta$$