

Unit #4: Parametrics and Polars

Topic: Parametrics and Polars Review

Objective: *SWBAT solve various problems with parametrics and polars.*

**CALCULATOR ALLOWED**

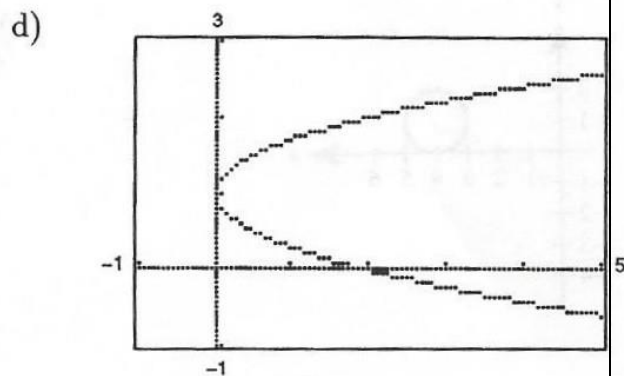
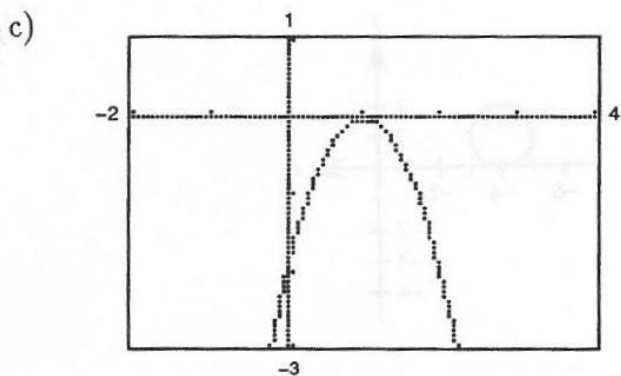
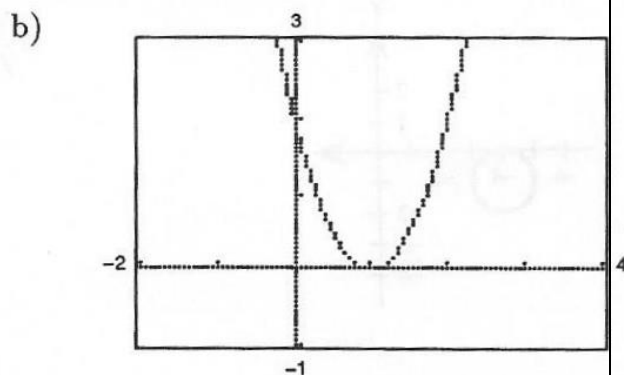
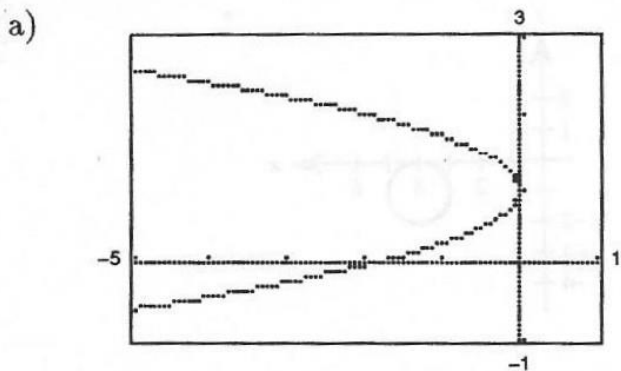
Directions: *Read each question carefully and show all work.*

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  $y = t + 1$ ?



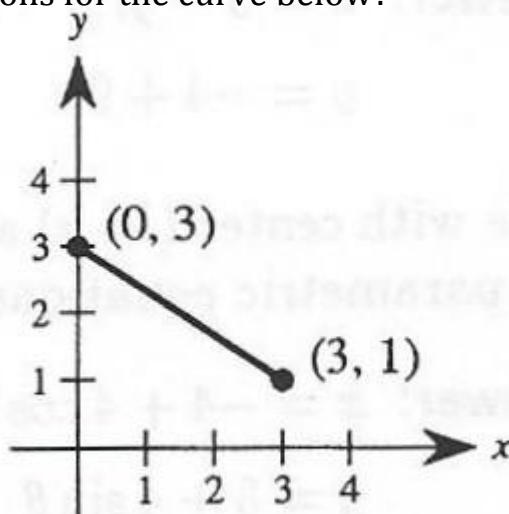
3) Which of the following are a set of parametric equations for the curve below?

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

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

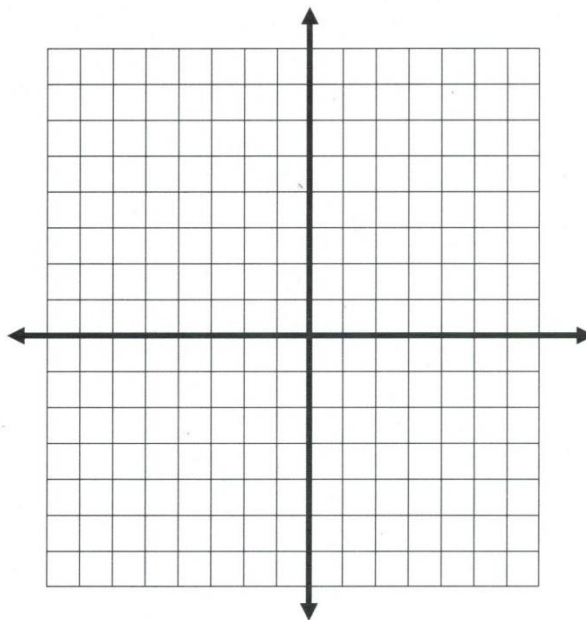
c)  $x = -\frac{3}{2}t$   
 $y = t - 3$

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)  $(3, \frac{5\pi}{3})$

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

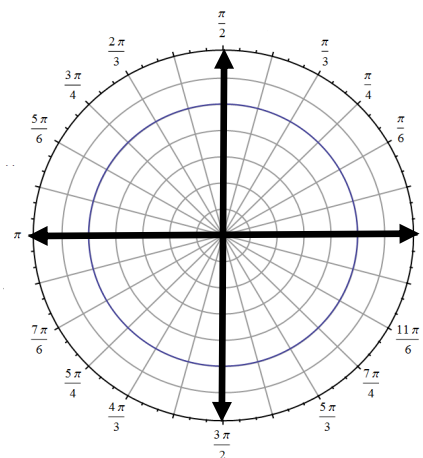
6) Convert from rectangular to polar coordinates:

a)  $(-1, -\sqrt{3})$

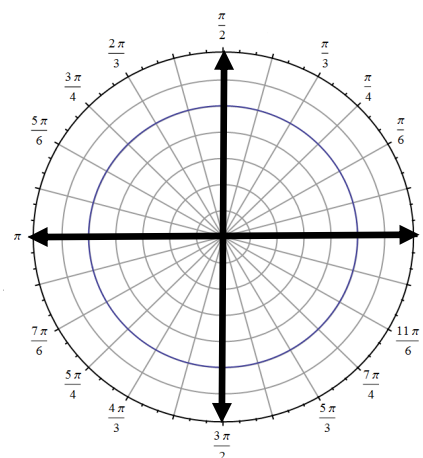
b)  $(0, -4)$

7) Plot the point whose polar coordinates are given below and then find three additional representations for each of them.

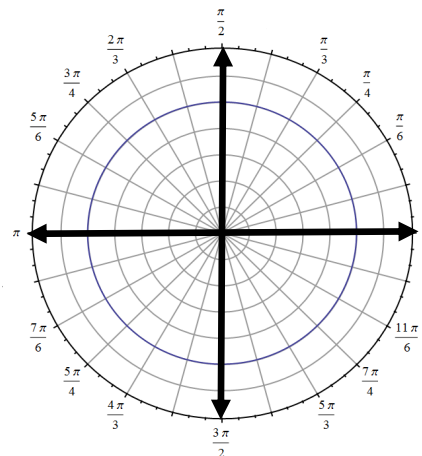
a)  $(2, -\frac{2\pi}{3})$



b)  $(-2, \frac{5\pi}{6})$



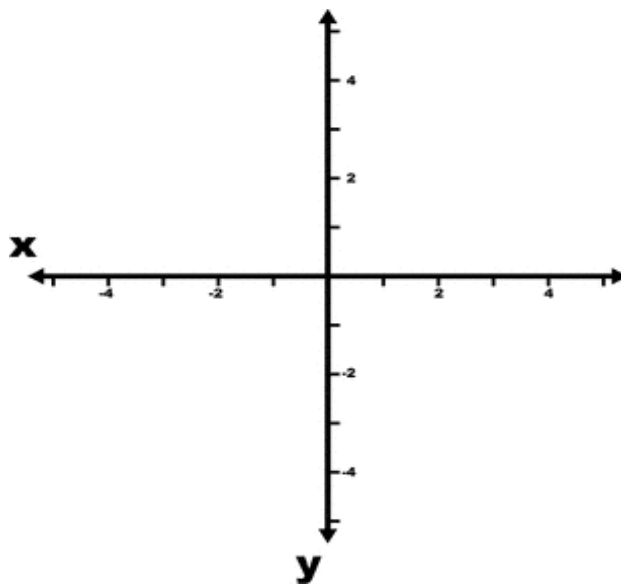
c)  $\left(3, \frac{\pi}{4}\right)$



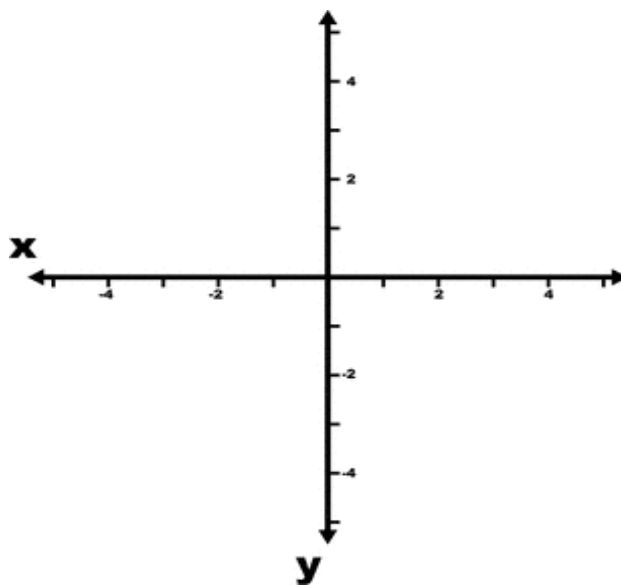
8) Determine two pairs of polar coordinates given the rectangular point  $(3, -3)$ .

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

$$r = -2\cos\theta \quad \text{and} \quad r = 2 + 2\cos\theta$$

