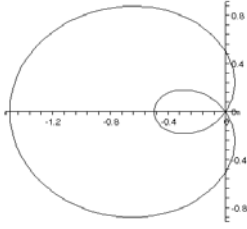


1. For the parametric curve  $x = t^2 + 4$ ,  $y = 6 - t$  for  $-\infty < t < \infty$ ,
  - a. Eliminate the parameter to obtain an equation in  $x$  and  $y$ .
  - b. Identify or briefly describe the curve.
2. Find an equation of the line tangent to the cycloid  $x = t - \sin t$ ,  $y = 1 - \cos t$  at  $t = \pi/6$ .
3. Find the slope of the line tangent to the polar curve  $y = 4 \sin 2\theta$  at the tip of the leaves.
4. Plot the point with polar coordinates  $(2, 5\pi/6)$ , then find the Cartesian coordinates of the points.
5. For the point with Cartesian coordinates  $(\sqrt{3}, -3)$ 
  - a. Find the polar coordinates  $(r, \theta)$  of the point, where  $r > 0$  and  $0 \leq \theta \leq 2\pi$ .
  - b. Find the polar coordinates  $(r, \theta)$  of the point, where  $r < 0$  and  $0 \leq \theta \leq 2\pi$ .
6. Replace the Cartesian equation by equivalent polar equations
  - a.  $x + y = 4$
  - b.  $(x - 5)^2 + y^2 = 25$
7. Replace the polar equation by the equivalent Cartesian equation. Then describe or identify the graph.
  - a.  $r = 4 \csc \theta$
  - b.  $r = 8 \cos \theta - 15 \sin \theta$
8. Write the equation of the tangent line to the curve  $r = 1 + \sin \theta$  at  $\theta = 3\pi/4$
9. Graph the polar equation
  - a.  $r = 4 \sin \theta$
  - b.  $r = 2 + 2 \cos \theta$
  - c.  $r = 5 \cos 3\theta$
10. Find the area inside  $r = 3 + 2 \sin \theta$  and outside  $r = 2$ .
11. Find the area that lies inside both curves  $r = \sin 2\theta$ ,  $r = \sin \theta$ .
12. Find the area of the region enclosed by the inner loop of  $r = \frac{1}{2} - \cos \theta$ . Set up the integral but do not evaluate.



13. Evaluate the expression and write your answer in the form  $x + yi$

a.  $\frac{1+4i}{3+2i}$

b.  $|2\sqrt{3} + 2i|$

14. Write  $6e^{i4\pi/3}$  in the form  $x + yi$

15. Find the indicated power of the following using De Moivre's Theorem. Write your answer in the form  $x + yi$

$$(-2 - 2i)^4$$

16. Find the fifth roots of 32. Sketch the roots in the complex plane.