

Worksheet 2, Math 53

Polar Coordinates

Wednesday, September 5, 2012

1. Sketch the curve given by $r = 2 \sin \theta$ and give its equation in Cartesian coordinates. What curve is it?
2. Write an equation in polar coordinates for the circle of radius $\sqrt{2}$ centered at $(x, y) = (1, 1)$.
3. (a) Does the spiral $r = 1/\theta, \pi/2 \leq \theta < \infty$ have finite length?
(b) Does the spiral $r = e^{-\theta}, 0 \leq \theta < \infty$ have finite length?
4. Find the points on the spiral $r = e^\theta$ where the tangent line is horizontal or vertical.
5. Find the area inside the larger loop and outside the smaller loop of the limaçon $r = \frac{1}{2} + \cos \theta$.