

2924 Problem Set #7
October 15, 2019

PROBLEM 1. Sketch the graph of $r = \sin(3\theta)$ first in the (θ, r) -plane and then in the (x, y) -plane. How many points of intersection does this polar curve have with each of the circles $r = 1/2$, $r = 1$, $r = 2$?

PROBLEM 2. Sketch the graph of the polar curve $r = 2 \cos(\theta)$ and then find the equation of the tangent line at the point P where $\theta = \pi/3$.

PROBLEM 3. Sketch the graph of the polar curve $r = 2 + \sin(3\theta)$, and then find the equation of the tangent line at the point P with $\theta = \pi/4$

PROBLEM 4. Find all points of intersection of the two polar curves (in both cases there are three):

(a) $r = 1 + \sin(\theta)$ and $r = 1 - \cos(\theta)$

(b) $r = \sin(\theta)$ and $r = \sin(2\theta)$

PROBLEM 5. Find the area of the region inside the two circles $r = 2 \cos(\theta)$ and $r = 2 \sin(\theta)$.