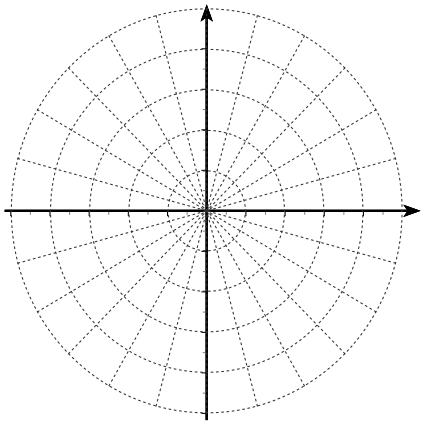
Math 360

Introduction to Polar Coordinates

1. Which polar coordinates represent the same point as $(3, \frac{\pi}{3})$?

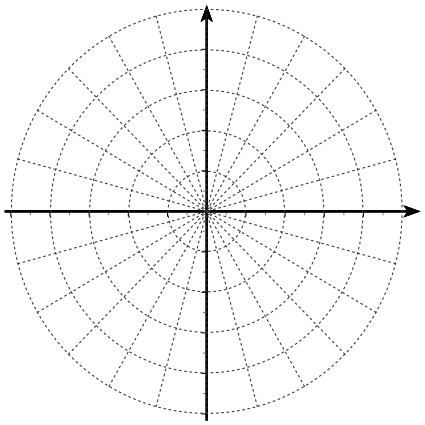


   (a) $(3, \frac{7\pi}{3})$ (b) $(3, \frac{-\pi}{3})$

   (c) $(-3, \frac{4\pi}{3})$ (d) $(3, \frac{-2\pi}{3})$

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

2. If $(x, y) = (-1, \sqrt{3})$ are rectangular coordinates of a point P, find three different pairs of polar coordinates (r, θ) for P such that

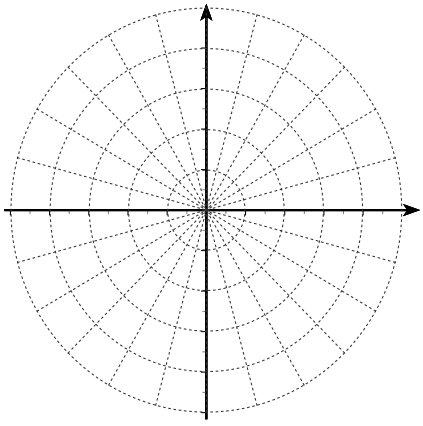


   (a) $r > 0$ and $0 < \theta < 2\pi$

   (b) $r > 0$ and $2\pi < \theta < 4\pi$

   (c) $r < 0$ and $0 < \theta < 2\pi$

3. Every line in the $xy-$plane can be written in the form $ax + by = c$. Using this equation, determine a polar equation for any line.



4. Express the following polar equations in terms of x and y and simplify. If possible, describe what

the graph looks like.

(a) $r = 4\sin\theta$

(b) $r = 4\sec\theta$