MA 114 Worksheet #25: Polar coordinates

- 1. Convert from rectangular to polar coordinates:
 - (a) $(1,\sqrt{3})$
 - (b) (-1, 0)
 - (c) (2, -2)
- 2. Convert from polar to rectangular coordinates:
 - (a) $\left(2, \frac{\pi}{6}\right)$ (b) $\left(-1, \frac{\pi}{2}\right)$ (c) $\left(1, -\frac{\pi}{4}\right)$
- 3. Sketch the graph of the polar curves:

(a)
$$\theta = \frac{3\pi}{4}$$

(b) $r = \pi$
(c) $r = \cos \theta$
(d) $r = \cos(2\theta)$
(e) $r = 1 + \cos \theta$
(f) $r = 2 - 5 \sin \theta$

4. Find the equation in polar coordinates of the line through the origin with slope $\frac{1}{3}$.

- 5. Find the polar equation for:
 - (a) $x^2 + y^2 = 9$
 - (b) x = 4
 - (c) y = 4
 - (d) xy = 4
- 6. Convert the equation of the circle $r = 2\sin\theta$ to rectangular coordinates and find the center and radius of the circle.
- 7. Find the distance between the polar points $(3, \pi/3)$ and $(6, 7\pi/6)$.