1. For each set of Polar coordinates (r, θ), match the equivalent Cartesian coordinates (x, y).

___1. $(4, \frac{3\pi}{2})$	A. $(0, -4)$
___2. $(-2, \frac{-2\pi}{3})$	B. $(-2\sqrt{2}, -2\sqrt{2})$
___3. $(4, \frac{-5\pi}{6})$	C. $(4\sqrt{3}, -4)$
___4. $(-8, \frac{-7\pi}{6})$	D. $(-3.5, 3.5\sqrt{3})$
___5. $(4, \frac{-3\pi}{4})$	E. $(1, 1\sqrt{3})$
___6. $(7, \frac{2\pi}{3})$	F. $(-2\sqrt{3}, -2)$

2. You are given the point $(1, \pi/2)$ in polar coordinates. (i) Find another pair of polar coordinates for this point such that $r > 0$ and $2\pi \leq \theta < 4\pi$.

   $r =$ _____ $\theta =$ _____

   (ii) Find another pair of polar coordinates for this point such that $r < 0$ and $0 \leq \theta < 2\pi$.

   $r =$ _____ $\theta =$ _____

3. You are given the point $(-2, \pi/4)$ in polar coordinates.

   (i) Find another pair of polar coordinates for this point such that $r > 0$ and $2\pi \leq \theta < 4\pi$.

   $r =$ _____ $\theta =$ _____

   (ii) Find another pair of polar coordinates for this point such that $r < 0$ and $-2\pi \leq \theta < 0$.

   $r =$ _____ $\theta =$ _____

4. Find a polar equation for the following Cartesian equations:

   (a) $x = 2$ (c) $x^2 + y^2 = 10$ (e) $x^2 + xy + y^2 = 1$

   (b) $xy = 4$ (d) $x^2 + (y-3)^2 = 9$ (f) $y = 1$

5. Find an equation in rectangular coordinates for the following polar equations:

   (a) $r\cos(\theta) = 3$ (c) $r = \dfrac{4}{2\cos(\theta) - \sin(\theta)}$ (d) $r = 9\sin(\theta)$

   (b) $r^2 = 4r\cos(\theta)$ (e) $r = 2\cos(\theta) + 2\sin(\theta)$

6. Sketch the following

   (a) $r = 1 + \cos(\theta)$ (b) $r = 1 + 2\cos(\theta)$ (c) $r = 4\sin(2\theta)$

7. Sketch the following and find the intersection points

   (a) $r = \sin(\theta); r = \cos(\theta)$ (c) $r = 2; r = 3 + 2\sin(\theta)$ (e) $r = \cos(\theta); r = 1 - \cos(\theta)$

   (b) $r = 2; r = 2\cos(2\theta)$ (d) $r = \sin(\theta); r = \sin(2\theta)$ (f) $r = \sin(3\theta); r = \cos(3\theta)$