ACMAT118 Spring 2024
Professor Manguba-Glover
Sections 8.5 Classwork (CW 13)   Name: _____

Complete as many of the following problems as you can with your table. You do not have to go in order. If **your entire group** finishes early, and your answers have been checked, you may leave early.

1. Convert the following polar coordinates to rectangular coordinates:

   (a) $\left(3, \dfrac{2\pi}{3}\right)$ (b) $\left(4, \dfrac{11\pi}{6}\right)$ (c) $\left(4, -\dfrac{\pi}{6}\right)$

2. Convert $(-1, -1)$ to polar coordinates.

3. Convert the following polar equations to rectangular equations:

(a) $r = 2\cos\theta$

(b) $r = \tan\theta$

(c) $r = 3\cos(2\theta)$

4. Convert the following rectangular equations to polar equations:

(a) $3x - 4y = 2$

(b) $y^2 = x^3$

(c) $2xy = 1$

Key (note that your answers may look different):

1. (a) $\left(-\frac{3}{2}, \frac{2\sqrt{3}}{3}\right)$

   (b) $(2\sqrt{3}, -2)$

   (c) $(2\sqrt{3}, -2)$

2. $\left(\sqrt{2}, \frac{5\pi}{4}\right)$

3. (a) $(x - 1)^2 + y^2 = 1$

   (b) $x^4 + x^2 y^2 - y^2 = 0$

   (c) $(x^2 + y^2)^3 = 9(x^2 - y^2)^2$

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

   (b) $r = \tan^2\theta\sec\theta$

   (c) $r^2 = \csc(2\theta)$