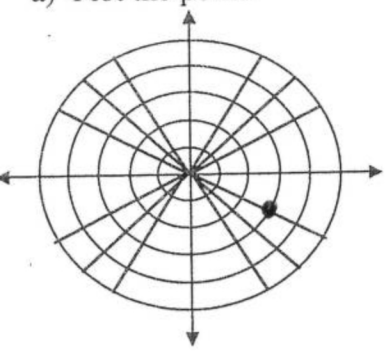
Analysis H – Deggeller / Hahn
Polar and 3D - Quiz 1 (30 points)

Name
Per

1. Consider the point $\left(-3, \frac{-7\pi}{6}\right)$.

a) Plot the point.



b) Find 3 different polar coordinates for this point in the domain $-2\pi \le \theta \le 2\pi$
Give all answers in radians. (1 pt each)

_____, _____, _____

c) Convert the point to rectangular coordinates. (2 points)

_____

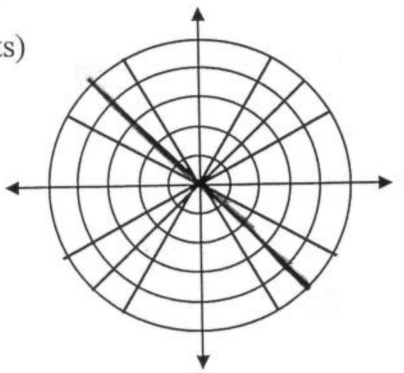
2. Convert each equation to rectangular form, and then graph.

a) $r = 4\cos\theta$

Rectangular equation: (3 pts)

_____

Graph: (2 pts)

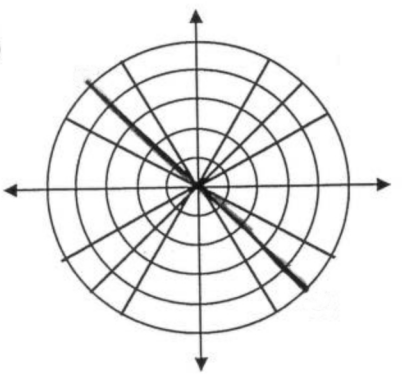


b) $\theta = -\frac{\pi}{4}$

Rectangular equation: (3 pts)

_____

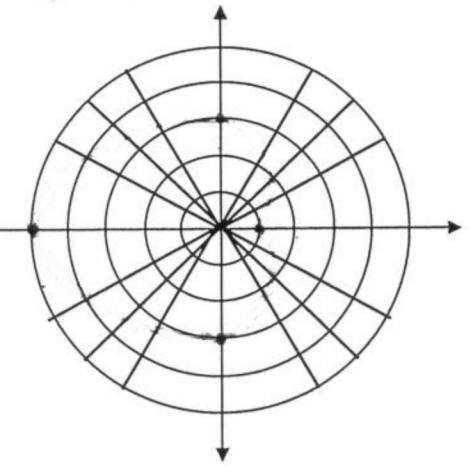
Graph: (2 pts)



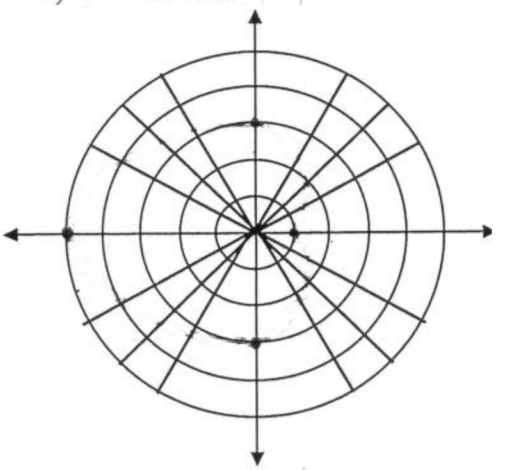
3. Convert the equation: $y = \pm\sqrt{\frac{1}{x^2} - x^2}$ into polar form. Write your answer in the form "r = ". (4 pts)

4. Graph each equation (2 pts each)

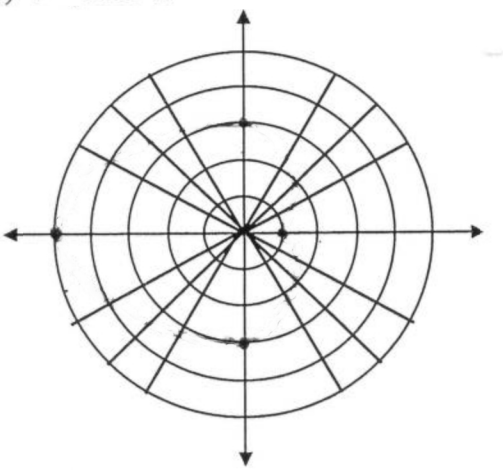
a) $r = 3 - 2\cos\theta$



b) $r^2 = 3\sin 2\theta$

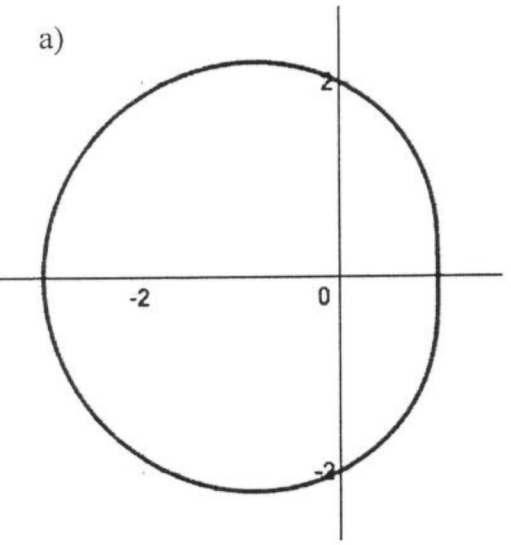


c) $r = 5\sin 4\theta$



5. Write the equation of each in polar form. (2 pts each)

a)



Equation: _____

c) A lemniscate that is not symmetric around the x axis, whose petals have a length of 12.

Equation: _____

8. Verify algebraically that $r = 3 - 4\sin\theta$ has $\theta = \frac{\pi}{2}$ symmetry. (4 pts)