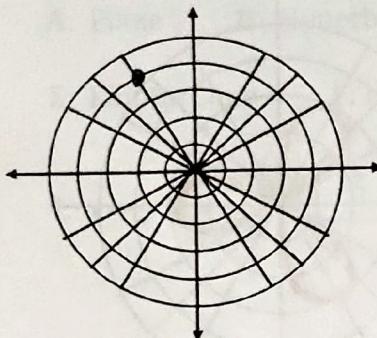


1. Consider the point $(-4, -\frac{\pi}{3})$
- a) Plot the point.
- b) Find 3 different polar coordinates for this point in the domain $-2\pi \leq \theta \leq 2\pi$
Give all answers in radians. (1 pt each)



_____ , _____ , _____

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

2. Show that the polar curve $r = 4\cos\theta - 6\sin\theta$ is a circle by changing it to rectangular. Then find the radius of the circle.

Rectangular equation: (3 pts)

radius (1 pt)

3. Convert the hyperbola $r = \frac{5}{2\cos\theta + 3\sin\theta}$ into rectangular.

Rectangular equation: (3 pts)

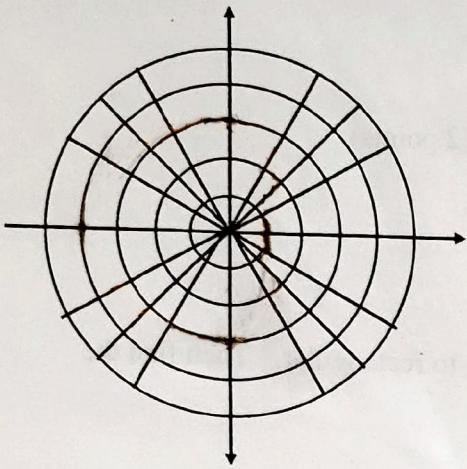
4. Convert the equation: $(x^2 + y^2)^2 = 32xy$ into polar form of the three curves we learned yesterday (polar rose, limacon or lemniscate).

Polar
Rectangular equation: (3 pts)

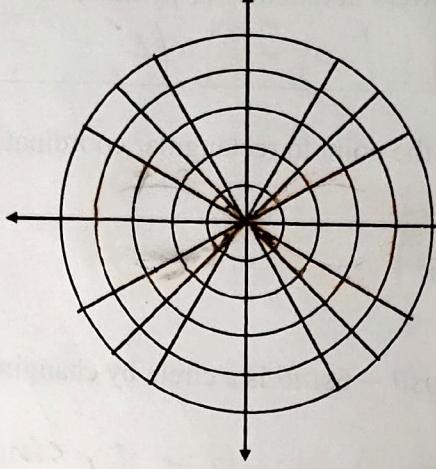
Name of Curve: (1 pt)

5. Graph each equation (2 pts each)

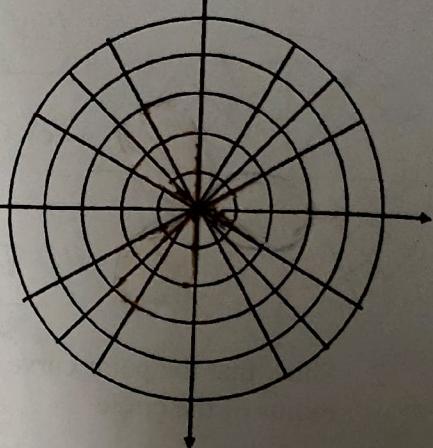
a) $r = 3 - 2\sin\theta$



b) $r^2 = 16\cos 2\theta$



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

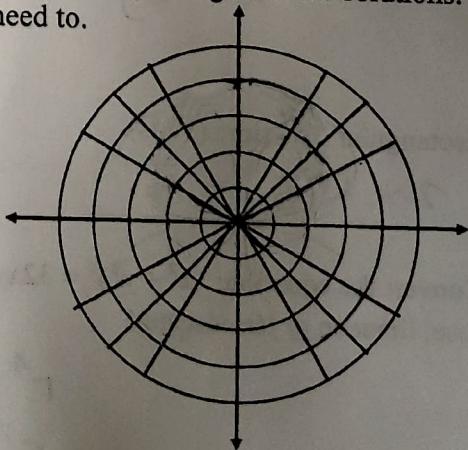


6. A) Write the equation of an inner loop limacon with a max r-value of 8 on the x-axis.

Equation _____ (3 pts)

B) For your equation above, name an angle at which it passes through the pole (origin). [2]

7. The system of equations $r = 4\sin\theta$ and $r = 2 + 2\sin\theta$ has exactly two geometric solutions. Find both of them. Feel free to graph if you'd like but you don't need to.



Solutions: _____

[3]