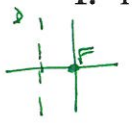
Pre-Calculus **HW#9.6-2** **Name:** Key

Write a polar equation for each conic with its focus at the pole.

1. Parabola ~~with eccentricity of 1 and~~ directrix at x=-1.

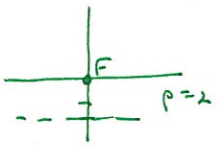


$p = 1$

$1 - \cos\theta$

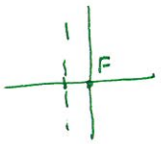
$$r = \frac{1}{1-\cos\theta}$$

2. Ellipse with eccentricity of 3/4 and directrix at y=-2.



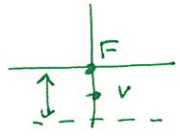
$$r = \frac{\frac{3}{4}\cdot 2}{1-\frac{3}{4}\sin\theta} \qquad r = \frac{\frac{3}{2}}{1-\frac{3}{4}\sin\theta} \quad \text{or} \quad r = \frac{6}{4-3\sin\theta}$$

3. Hyperbola with eccentricity of 3/2 and directrix at x=-1.



$$r = \frac{\frac{3}{2}\cdot 1}{1-\frac{3}{2}\cos\theta} \qquad r = \frac{\frac{3}{2}}{1-\frac{3}{2}\cos\theta} \quad \text{or} \quad r = \frac{3}{2-3\cos\theta}$$

4. Parabola with vertex at $(1,-\frac{\pi}{2})$.

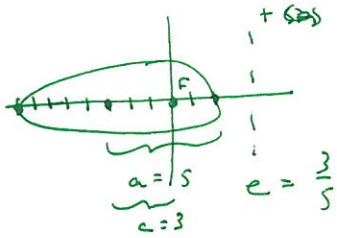


$p = 2 \quad e = 1$

$$r = \frac{1\cdot 2}{1-1\sin\theta}$$

$$r = \frac{2}{1-\sin\theta}$$

5. Ellipse with vertices at $(2,0)$ and $(8,\pi)$.



$e = \frac{3}{5}$

$$r = \frac{\frac{3}{5}p}{1+\frac{3}{5}\cos\theta}$$

$$r = \frac{3p}{5+3\cos\theta}$$

$$2 = \frac{3p}{5+3\cos 0}$$

$16 = 3p$

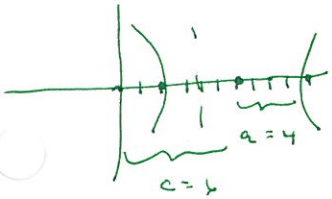
$\frac{16}{3} = p$

$$r = \frac{\frac{16}{3}}{1+\frac{3}{5}\cos\theta}$$

or

$$r = \frac{16}{5+3\cos\theta}$$

6. Hyperbola with vertices at (2,0) and (10,0).



$e = \frac{6}{4} = \frac{3}{2}$

$$r = \frac{\frac{3}{2}p}{1+\frac{3}{2}\cos\theta}$$

$$r = \frac{3p}{2+3\cos\theta}$$

$$2 = \frac{3p}{2+3\cos 0} \rightarrow 10 = 3p \quad \frac{10}{3} = p$$

$$r = \frac{5}{1+\frac{3}{2}\cos\theta}$$

or

$$r = \frac{10}{2+3\cos\theta}$$