Class Discussion

Unit 9 Topic 7 Part 1 Conics in the polar equation form

A polar equation with the following form are conics with focus on the pole and directrix at either $x = a$

or $y = a$ (a is a constant)

$$r = \frac{ep}{1 \pm e\cos\theta}$$ with vertical directrix $x = p$

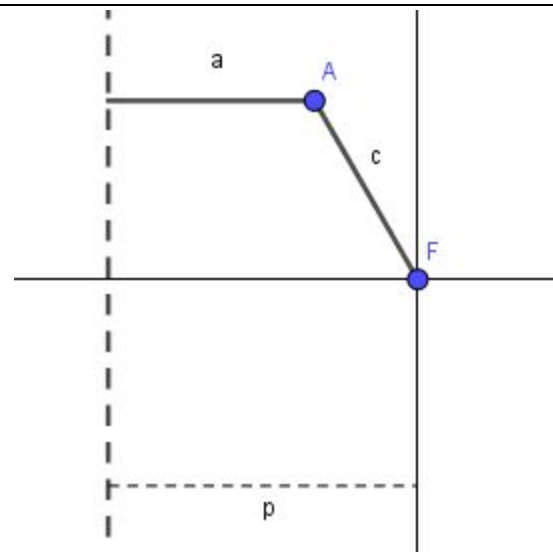$$r = \frac{ep}{1 \pm e\sin\theta}$$ with horizontal directrix $y = p$

Where

e : eccentricity. $e = \dfrac{c}{a}$, $e \in (0,\infty)$ If $e < 1$, the conic is an ellipse If $e = 1$, the conic is a parabola If $e > 1$, the conic is a hyperbola	

Ex 1: Identify the location and orientation of the directrix

(a) $r = \dfrac{2}{1 + \cos\theta}$ (b) $r = \dfrac{2}{1 - \cos\theta}$ (c) $r = \dfrac{2}{1 + \sin\theta}$ (d) $r = \dfrac{2}{1 - \sin\theta}$

Ex 2: Graph $r = \dfrac{2}{2 + \cos\theta}$