Quiz 8
11/13/2023

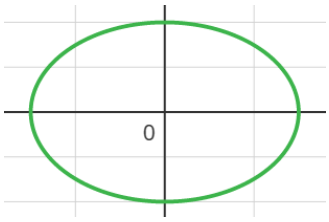
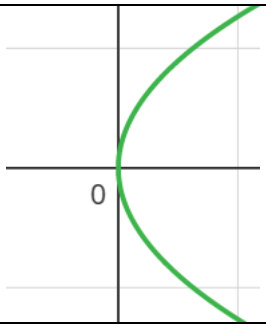
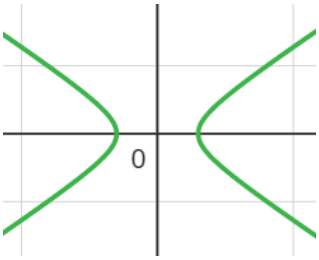
1. Identify the type of conic section whose equation in Cartesian coordinates is given by $x^2 - 2x = y^2$. Find the vertices, foci, eccentricity, directrix.

2. A conic section has an equation in polar coordinates as follows:

$$r = \frac{4}{5 - 4\sin\theta}$$

Find the eccentricity, identify the conic, give an equation of the directrix, and sketch the conic.

Conic Section formulas

	Ellipse	**Parabola**	**Hyperbola**
Cartesian equation	$\frac{x^2}{a^2}+\frac{y^2}{b^2}=1 \quad (a \geq b)$	$y^2=4px \quad (p>0)$	$\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$
Shape			
Vertex	$(\pm a, 0)$	$(0,0)$	$(\pm a, 0)$
Foci	$(\pm c, 0)$ where $c=\sqrt{a^2-b^2}$	$(p,0)$	$(\pm c, 0)$ where $c=\sqrt{a^2+b^2}$
Eccentricity	$e=\frac{c}{a}$	$e=1$	$e=\frac{c}{a}$
Directrices	$x=\pm d$ where $d=\frac{a^2}{c}$	$x=-d$ where $d=p$	$x=\pm d$ where $d=\frac{a^2}{c}$
Polar equation (the pole being at one of the foci)	$r=\frac{ed}{1\pm e\cos\theta}$ (d is the distance from the pole to the directrix)		