

Section 10.9 Polar Equations of Conics

Objective: In this lesson you learned how to define a conic in terms of eccentricity and to write equations of conics in polar form.

Course Number

Instructor

Date

I. Alternative Definition of Conics (Page 834)

The locus of a point in the plane that moves so that its distance from a fixed point (focus) is in a constant ratio to its distance from a fixed line (directrix) is a _____. The constant ratio is the _____ of the conic and is denoted by e . Moreover, the conic is an ellipse if _____, a parabola if _____, and a hyperbola if _____.

For each type of conic, the _____ of the polar coordinate system corresponds to the fixed point (focus) given in the above definition.

What you should learn

How to define a conic in terms of eccentricity

II. Polar Equations of Conics (Pages 834–836)

The graph of the polar equation _____ is a conic with a vertical directrix to the right of the pole, where $e > 0$ is the eccentricity and $|p|$ is the distance between the focus (pole) and the directrix.

The graph of the polar equation _____ is a conic with a vertical directrix to the left of the pole, where $e > 0$ is the eccentricity and $|p|$ is the distance between the focus (pole) and the directrix.

The graph of the polar equation _____ is a conic with a horizontal directrix above the pole, where $e > 0$ is the eccentricity and $|p|$ is the distance between the focus (pole) and the directrix.

What you should learn

How to write equations of conics in polar form

The graph of the polar equation _____
 is a conic with a horizontal directrix below the pole, where $e > 0$
 is the eccentricity and $|p|$ is the distance between the focus
 (pole) and the directrix.

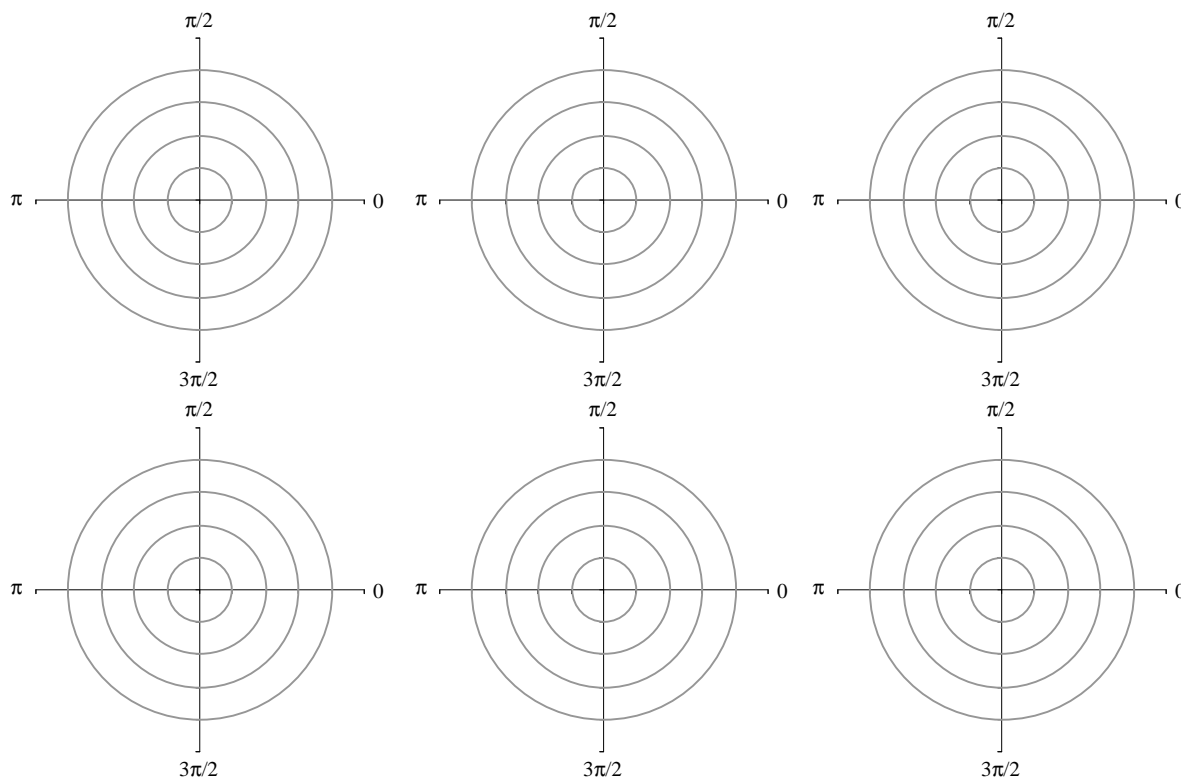
Example 1: Identify the type of conic from the polar equation

$$r = \frac{36}{10 + 12 \sin \theta}, \text{ and describe its orientation.}$$

III. Applications (Page 837)

Describe a real-life application of polar equations of conics.

What you should learn
 How to use equations of
 conics in polar form to
 model real-life problems



Homework Assignment

Page(s)

Exercises