

Section 10.3 Ellipses

Objective: In this lesson you learned how to write the standard form of the equation of an ellipse.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Foci Distinct fixed points in the plane such that the sum of the distances from each point on an ellipse is constant.

Vertices Points of intersection of an ellipse and the line through its foci.

Major axis The chord connecting the vertices of an ellipse.

Center The midpoint of the major axis of an ellipse.

Minor axis The chord perpendicular to the major axis at the center of an ellipse.

I. Introduction (Pages 742–745)

An ellipse is _____ the set of all points (x, y) in a plane, the sum of whose distances from two distinct fixed points (foci) is constant _____.

What you should learn

How to write equations of ellipses in standard form and graph ellipses.

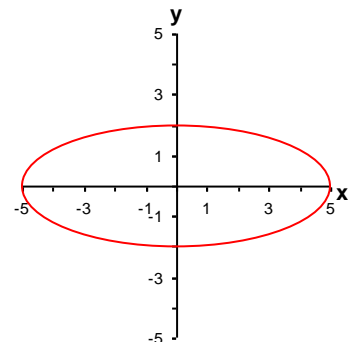
The standard form of the equation of an ellipse centered at (h, k) and having a horizontal major axis of length $2a$ and minor axis of length $2b$, where $0 < b < a$, is: _____ $(x - h)^2/a^2 + (y - k)^2/b^2 = 1$ _____

The standard form of the equation of an ellipse centered at (h, k) and having a vertical major axis of length $2a$ and minor axis of length $2b$, where $0 < b < a$, is: _____ $(x - h)^2/b^2 + (y - k)^2/a^2 = 1$ _____

In both cases, the foci lie on the major axis, c units from the center, with $c^2 =$ _____ $a^2 - b^2$ _____.

If the center is at the origin $(0, 0)$, the equation takes one of the following forms: _____ $x^2/a^2 + y^2/b^2 = 1$ _____ or _____ $x^2/b^2 + y^2/a^2 = 1$ _____.

Example 1: Sketch the ellipse given by $4x^2 + 25y^2 = 100$.



II. Applications of Ellipses (Page 746)

Describe a real-life application in which parabolas are used.

Answers will vary.

What you should learn

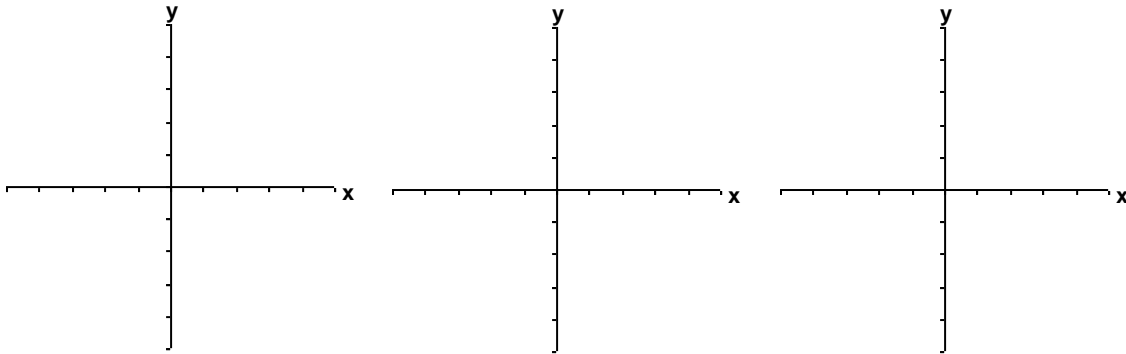
How to use properties of ellipses to model and solve real-life problems

III. Eccentricity (Pages 746–747)

Eccentricity measures the ovalness of an ellipse. It is given by the ratio $e = \frac{c}{a}$. For every ellipse, the value of e lies between 0 and 1. For an elongated ellipse, the value of e is close to 1.

What you should learn

How to find eccentricities of ellipses

Additional notes**Homework Assignment**

Page(s)

Exercises