

Unit 8

Topics

This unit begins our study of the conic sections: parabolas, ellipses, and hyperbolas.

We will only consider conics in standard position (parabolas with vertex at the origin, ellipses and hyperbolas with center at the origin), and in standard orientation in this unit. We will study translated conics and rotated conics in Unit 9. Therefore, certain portions of sections 10.2-4 (detailed below in the Study Guideline) will not be covered in this unit.

- Parabolas (10.2)
 - definition
 - focus, vertex, axis, directrix
 - graphing a parabola
 - finding the equation of a parabola
 - applications
- Ellipses (10.3)
 - definition
 - foci, major and minor axes, vertices, center, x and y intercepts
 - graphing an ellipse
 - finding the equation of an ellipse
 - applications
- Hyperbolas (10.4)
 - definition
 - foci, transverse and conjugate axes, vertices, center, x and y intercepts, asymptotes
 - graphing a hyperbola
 - finding the equation of a hyperbola
 - applications

Study Guidelines for the 8th edition of Sullivan's *Precalculus*

The only way to learn mathematics is to do mathematics.

Section 10.1: Conics

- **Reading:** section 10.1
- **Section 10.2: Parabolas**
 - **Reading:** section 10.2
Read objectives 1 and 3.
Read and work through examples 1-5 and example 8 and their matched problems.
 - The [parabolas](#) applet illustrates the various types of parabolas which have vertex at (0,0).
 - **Objective 2 (Vertex at (h,k))** will be covered in Unit 9. However, you should be able to find the equation of any parabola using the definition on page 625.
 - [Additional examples](#)
 - **Practice Problems:** 10.2 #1-5, 11, 14, 16, 17, 19, 21, 23, 25, 27, 37, 39, 63-73 odds
- **Section 10.3: Ellipses**
 - **Reading:** section 10.3
Read objectives 1 and 3.
Read and work through examples 1-4 and example 7 and their matched problems.
 - The [ellipses](#) applet illustrates the various types of ellipses which have center at (0,0).

- **Objective 4 (Center at (h,k))** will be covered in Unit 9.
- **Practice Problems:** 10.3 #1-6, 13-16, 17-37 odd, 65-81 odds

- **Section 10.4: Hyperbolas**
 - **Reading:** section 10.4
Read objectives 1, 2, and 4.
Read and work through examples 1-6 and example 9 and their matched problems.
 - The [hyperbolas](#) applet illustrates the various types of hyperbolas which have center at $(0,0)$.
 - **Objective 3 (Center at (h,k))** will be covered in Unit 9.
 - **Practice Problems:** 10.4 #1-6, 13-16, 17-37 odd, 61-67 odds