

## 12.1: Parametric Equations

**Learning Objectives.** Upon successful completion of Section 12.1, you will be able to...

- Graph and describe parametric equations and eliminate the parameter to find equations in  $x$  and  $y$ .
- Find parametric equations for a given description of a curve.
- Solve applications involving parametric equations.
- Differentiate parametric equations.
- Find the slopes and equations of tangent lines to a parametric equation.
- Find the arc length of a parametric curve.
- Answer conceptual questions involving parametric equations.
- Find the area under a parametric curve.
- Find the area of a surface of revolution of a parametric curve.

**Title**