

Section 10.6 Parametric Equations

Objective: In this lesson you learned how to rewrite a set of parametric equations as a rectangular equation and find a set of parametric equations for a graph.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Parameter A third variable introduced to represent a curve in the plane.

I. Plane Curves (Page 769)

If f and g are continuous functions of t on an interval I , the set of ordered pairs $(f(t), g(t))$ is a(n) plane curve C . The equations $x = f(t)$ and $y = g(t)$ are parametric equations for C , and t is the parameter.

What you should learn

How to evaluate sets of parametric equations for given values of the parameter

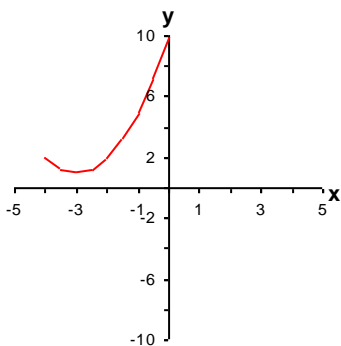
II. Sketching a Plane Curve (Page 770)

When sketching a curve represented by a pair of parametric equations, you plot the points in the xy-plane. Each set of coordinates (x, y) is determined from a value chosen for the parameter t . Plotting the resulting points in the order of increasing values of t traces the curve in a specific direction, called the orientation of the curve.

What you should learn

How to sketch curves that are represented by sets of parametric equations

Example 1: Sketch the curve described by the parametric equations $x = t - 3$ and $y = t^2 + 1$, $-1 \leq t \leq 3$.



III. Eliminating the Parameter (Pages 771–772)

Eliminating the parameter is the process of finding a rectangular equation (in x and y) that has the same graph as a set of parametric equations.

Describe the process used to eliminate the parameter from a set of parametric equations.

Start with the set of parametric equations. Solve for t in one equation. Then substitute for t in the other parametric equation. Simplify. The resulting equation is a rectangular equation.

When converting equations from parametric to rectangular form, you may need to alter the domain of the rectangular equation so that its graph matches the graph of the parametric equations.

To eliminate the parameter in equations involving trigonometric functions, try using the identities $\sin^2 \theta + \cos^2 \theta = 1$ or $\sec^2 \theta - \tan^2 \theta = 1$.

IV. Finding Parametric Equations for a Graph

(Pages 772–773)

Describe how to find a set of parametric equations for a given graph.

Answers will vary.

What you should learn

How to rewrite sets of parametric equations as single rectangular equations by eliminating the parameter

What you should learn

How to find sets of parametric equations for graphs

Homework Assignment

Page(s)

Exercises