Homework Answers

Section 1.3 (page 26 - 27):

13
14
15
16
17

18
26
28
32

Notes

Overview

- Why have parametric curves?
- What are parametric curves?
- How do you graph parametric curves on the calculator?

Notes

Motivation

A typical curve is written as $f(x) = x^3 - 3$.
Each point on the curve is calculated as $(x, f(x))$
If $f(x)$ is a function, that means we cannot graph things like circles, orbits, ellipses, etc, because they fail the vertical line test.
Our goal is to try to find a way to represent as functions - and to graph - circles, ellipses, and more complication curves.
We do that by graphing relations. (Remember, a relation is a set of ordered pairs. Every function is a relation.)

Notes

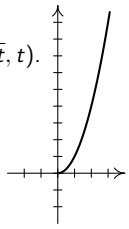
Parametric Curves

Definition (Parametric Curves)

If two functions $x = f(t)$ and $y = g(t)$ are given, over an interval of t-values, then the set of points $(x, y) = (f(t), g(t))$ is called a parametric curve.

Example ($x = \sqrt{t}$, $y = t$)

Each point will have the form $(\sqrt{t}, t)$.
Therefore $D = t; t \geq 0$



Notes

Definitions

- t is the parameter for the curve, and its domain I is the domain interval.
- Over the closed interval $I = a \leq t \leq b$
  - The initial point is $(f(a), g(a))$
  - The terminal point is $(f(b), g(b))$

Notes

Using the Graphing Calculator

1. Change the [Mode] to **Par**ametric, from **Func**tion.
2. Enter X_1 and Y_1 using the [Y =] button.
   Use $x_1 = cos(t)$ and $y_1 = sin(t)$ as example.
3. Set the domain interval by using the [Window] button and setting Tmin and TMax.
4. Hit graph.

Notes

Challenge, Homework

Experiment with different X_1 and Y_1 functions;
Can you find any interesting ones? If so, write them on the board.

Section 1.4 Quick Review (page 34):

4

5

6

7

8

9 a

b

10 a

a

a

Section 1.4 (page 34):

1

2

3

4

Notes

Notes

Notes