Math 199, Spring 2022
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Preparation Assignment 12 - Parametric equations

Estimated Time: 30 minutes.

Goals: During class on Friday, we will work through various examples that deal with parametric equations. The point of this preparation assignment is to make sure you understand what parametric equations are, and how we graph them, before diving into some problems.

I uploaded a handwritten page on parametric equations to the website (under "Miscelaneous notes/summaries"). Read through this, and review your lecture notes on parametric equations.

1) Given a curve in the plane (just the geometric figure), explain how you can represent this curve in two ways:
(a) as a function of one variable;
(b) with parametric equations.
Hint: To rephrase, (ordinary) functions and parametric equations are often both represented geometrically by curves. Explain how this is done.

2) Give two examples of curves in the plane and represent them in both ways that you outlined in (1).

3) When you plot parametric equations $(x(t), y(t))$ in a plane, is there something you can look at to identify the inputs "t"? If so, describe how to do this. If not, why is it different from when we plot an ordinary function in the plane?

4) Is it possible for two *different* pairs of parametric equations to represent the *same* curve in the plane?

5) Can you think of another way to geometrically represent, i.e. "graph", the data given by parametric equations $(x(t), y(t))$, that is more analogous to the way we graph an ordinary ("Calc I") function? There is more than one answer to this question.

6) To really nail this down, let's do the opposite of what (4) asked. Can you think of another way to geometrically represent, i.e. "graph", the data given by an ordinary function $f(x)$, that is more analogous to the way we typically graph parametric equations?