## Reading 3 (Due Monday 7/1/24 by 12:55 PM)

**Directions:** Read the following sections of the book:

- Section 9.5.1
- Section 9.5.2
- All of Section 9.6. I'm not going to lecture on this section at all during class.

and complete the following tasks along the way. If an Activity is not listed, you do not need to complete it (although you are welcome to read it). Turn your write up in via gradescope. You do not need to write the questions down, as long as you clearly indicate the question number.

- 1. Complete Preview Activity 9.5.1.
- **2.** Complete Activity 9.5.2.
- **3.** Complete Preview Activity 9.6.1.
- 4. Activity 9.6.2. I recommend using GeoGebra to graph the curves. You can find directions online for plotting parametric curves with GeoGebra. You do not need to include the graphs in your write-up.
- 5. Activity 9.6.3. You do not need to submit anything for part (e). I recommend using GeoGebra or GeoGebra 3D. You do not need to include the graphs in your write-up.

**Basic learning objectives:** These are the tasks you should be able to perform with reasonable fluency **when you arrive at our next class meeting**. Important new vocabulary words are indicated in italics.

- 1. Compute the vector equation of a line given a point contained in the line and the direction of the line. Compute the parametric equations of a line.
- 2. State the definitions of vector-valued functions, the graph of a vector valued function, and the parametric equations of a curve. Describe the relationship between vector-valued functions and parametric equations.
- 3. State various examples of vector-valued functions and parametric curves.
- 4. Graph parametric curves using a graphing calculator or other appropriate technology (like GeoGebra or Desmos).
- 5. Parameterize various curves such as lines and circles and ellipses in  $\mathbb{R}^2$  or  $\mathbb{R}^3$ , the intersection of two graphs, etc.

Advanced learning objectives: In addition to mastering the basic objectives, here are the tasks you should be able to perform after class, with sufficient practice:

- 1. Determine when two nonzero vectors are parallel. Determine when three points in  $\mathbb{R}^3$  are collinear. Determine when three vectors in  $\mathbb{R}^3$  are coplanar. Understand the geometric intuition behind the solutions to these types of problems.
- 2. State the definition of a plane and understand why a plane can be specified uniquely by a point in the plane and a vector perpendicular to the plane.
- 3. Understand several different ways to describe the equation of a plane. Compute the equation of a plane given various geometric parameters.
- 4. Parameterize the traces and level curves of a function f(x, y) of two variables.