Day 1 (Thursday)

- Review the material in Section 10.5 and read Section 10.7.

- **Section 10.5**: Do Exercises 16–18.

- **Section 10.7**: Do Exercises 23, 42, and 50.

- (Call this **Problem ★1**, as it is not from the text.) Consider the vector functions

  \[ r_1(t) = (t)i + (t^2)j, \quad -1 \leq t \leq 1, \]

  and

  \[ r_2(t) = (1 - 2t^2)i + (1 - 2t^2)^2j, \quad -1 \leq t \leq 1. \]

  (a) Both \( r_1 \) and \( r_2 \) produce the same curve. Sketch it. If you wanted a function \( y = f(x), \ a \leq x \leq b \), whose graph was this curve, what function \( f \) and endpoints \( a, b \) to its domain would do the job?

  (b) Find the approximate arc length for the parametrized curves \( r_1 \) and \( r_2 \). (Do not assume they are equal.) It is quite likely difficult to antidifferentiate the speed \(|dr/dt|\) for each of these curves, so you will want to employ some sort of numerical integration technique.

  (c) Which of the parametrizations \( r_1, r_2 \) is smooth? What does this have to do with your answer(s) from part (b)?

- **Problem ★2**: Give a parametrization for a circle centered at point \((4, -1, 2)\) with radius \( R \) with \( 0 < R < 4 \) lying in the plane \( z = 2 \). Write it so, viewed from above (far out in the positive \( z \)-direction), the circle is traversed in the clockwise direction, beginning and ending at the point closest to the \( yz \)-plane.

Day 2 (Friday)

- Read Section 13.2 up through Example 6 on p. 737.

- **Section 13.2**: Do Exercises 2, 3, 5, 10, 12, and 28. For this last one, you need only find the mass, not the center of mass.