Please consider taking the Student Experience of Teaching Survey (SETS) which closes on Tuesday 8/26 at 11:59PM.

Weekly 4 (Due Tuesday 8/29 at 11:59PM)

Overview: This assignment is worth **56 points**. Each question has multiple parts and each part is worth **4 points**. The grader determines your score for each part of each problem using the Weekly Assignment Rubric. Specifically, the grader will be looking for evidence of conceptual understanding, correct mathematical reasoning, and excellent written-communication.

Guidelines: You are required to adhere to the Weekly assignment guidelines and the Use of Generative AI policy, which can be found on pages 3 and 4 of the syllabus. Turn in your assignment via gradescope.

Directions: Complete the following exercises from the Active Calculus textbook. You can click the links below to go directly to the exercise.

1. (12 points) Exercise 11.3.11 parts (a),(b), and (d) only.
2. (16 points) Exercise 11.5.19.
3. (12 points) Exercise 11.6.11 parts (a)-(c) only.
4. (16 points) Consider the solid region R bounded by the sphere $x^2 + y^2 + z^2 = 16$ and the cone $z = \sqrt{x^2 + y^2}$.
   (a) Set up, but do not evaluate, a triple integral in Cartesian coordinates that gives the volume of the solid R. Your solution to this part should include appropriate sketches of the regions involved.
   (b) Compute the Jacobian for the transformation which converts spherical coordinates to Cartesian coordinates. See Excercise 11.9.12.
   (c) Use the Change of Variables formula to set up a triple integral in Spherical coordinates that is equal to the volume of the solid region R.
   (d) Evaluate one of the integrals from (a) or (c).