1. *The region in the first quadrant that is bounded above by the curve $y = 1/x^{1/4}$, on the left by the line $x = 1/16$, and below by the line $y = 1$ is revolved about the x-axis to generate a solid. Find the volume of the solid by*

    a. *the washer method.*

    b. *the shell method.*

2. *The region shown here is to be revolved about the y-axis to generate a solid. Which of the methods (disk, washer, shell) could you use to find the volume of the solid? How many integrals would be required in each case? Give reasons for your answers.*

3. $y = \int_0^x \tan t\, dt$, $0 \le x \le \pi/6$.

    a. *Set up an integral for the length of the curve.*

    b. *Graph the curve to see what it looks like.*

    c. *Find the length of the curve.*

4.   a. *Find a curve through the point (1, 1) whose length integral is $L = \int_1^4 \sqrt{1 + \frac{1}{4x}}\, dx$.*

    b. *How many such curves are there? Give reasons for your answer.*

5. $\delta(x) = \begin{cases} 2 - x, & 0 \le x < 1, \\ x, & 1 \le x \le 2 \end{cases}$ *gives a density function of a thin rod lying along the given interval of the x-axis. Find a rod's moment about the origin, mass, and center of mass.*

6. *Find the moment about the x-axis of a wire of constant density that lies along the curve $y = \sqrt{x}$ from $x = 0$ to $x = 2$.*