1. A paraboloid dish (cross section ) is 8 units deep. It is filled with water up to a height of 4 units. How much water must be added to the dish to fill it completely?

4. Write an integral that represents the volume of the solid formed by rotating the region bounded by , , , and  about (a) the  axis; (b) the line ; and (c) the line , where .

15. Consider the solid formed by rotating the curve  from  to  about the  axis. Let  be the function whose value is the volume of the solid between  and . (a) What is ? (b) For some small , what is ? (c) Using the definition of the derivative, find the definite integral that represents the total volume of the solid. (Let  be a function such that .)

26. Find the volume of the top quarter of a sphere: .