Problem statement A sort of raindrop is obtained by revolving the profile curve

$$y = \sqrt{x}(x - C)^2 \text{ for } 0 \le x \le C$$

about the x-axis. Here C is a positive constant.

a) Sketch the profile curve and the solid of revolution.

b) For which value of C will the raindrop have volume 1? What are the approximate dimensions (length and diameter) of this raindrop?