Section 1: Volumes of revolution

Exercise level 3

1. The corners of a trapezium are at the points (0, 1), (0, 3), (3, 3) and (2, 1). Find the volume of the solid formed by rotating the trapezium through 360° about the y-axis.

2. Use integration to find the formula for the volume of a sphere of radius r.

3. A hemispherical bowl of internal radius 9 cm contains water to a maximum depth of 6 cm. Find the volume of the water.

4. The region enclosed by both axes, the line $x = 2$ and the curve $y = \frac{1}{8}x^2 + 2$ is rotated 360° about the y-axis to form a solid. Find the volume of this solid.