

1. A particle moves on the x -axis so that its position at any time $t \geq 0$ is given by $x(t) = 2te^{-t}$.

 - a. Find the total distance traveled by the particle from $t = 0$ to $t = 5$.
 - b. Find the net displacement from $t = 0$ to $t = 5$.
2. Consider the curve $y^2 = 4 + x$ and the chord AB joining points $A(-4, 0)$ and $B(0, 2)$ on the curve.

 - a. Find the area of the region R enclosed by the curve and the chord AB .
 - b. Find the volume of the solid generated when the region R , defined in part (a), is revolved about the x -axis.

3. Let R be the region enclosed by the y -axis, the line $y = 3$, and the curve $y = \sqrt{x}$.

Find the volume of the solid whose base is R and whose cross sections cut by planes perpendicular to the x -axis are:

a. Squares

b. equilateral triangles

4. Let R be the region enclosed by $y = x^3$, $y = 1$, $x = 2$, and the x -axis. Find the volume of the solid formed by revolving the region about the line $x = -1$.