

2003 AB1/BC1

1a. The point of intersection of $y = \sqrt{x}$ and $y = e^{-3x}$ is $x = 0.238734$ so the

integral for the area is $\int_{0.238734}^1 (\sqrt{x} - e^{-3x}) dx = 0.44263$

1b. The volume is found by using washers

$$\pi \int_{0.238734}^1 \left((1 - e^{-3x})^2 - (1 - \sqrt{x})^2 \right) dx = 1.42356$$

1c. The base of the rectangle is $(\sqrt{x} - e^{-3x})$. The height of the rectangle is

5. So the volume is $\int_{.238734}^1 5(\sqrt{x} - e^{-3x})^2 dx = 1.55435$