

$$V = \int_0^1 2\pi \cdot 3xe^{-x^2} dx. \text{ Let } u = x^2. \text{ Thus, } du = 2x dx, \text{ so}$$

$$V = \pi \int_0^1 3e^{-u} du = 3\pi[-e^{-u}]_0^1 = 3\pi(1 - e^{-1}).$$

