

$$a) \int_0^3 \pi (3u - u^2)^2 du = \pi \left[3u^3 - \frac{3}{2}u^4 + \frac{1}{5}u^5 \right]_0^3 = 8\pi$$

$$b) \int_0^a \pi a^2 du = \frac{\pi a^3}{2}$$