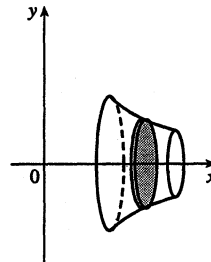
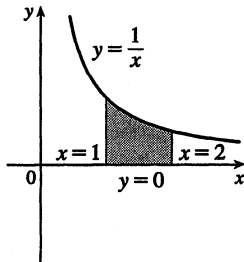


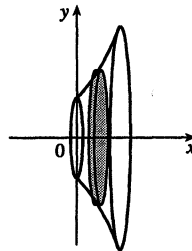
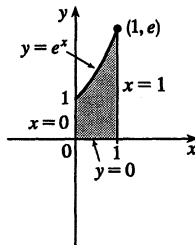
1. A cross-section is a disk with radius  $1/x$ , so its area is  $A(x) = \pi(1/x)^2$ .

$$V = \int_1^2 A(x) dx = \int_1^2 \pi \left(\frac{1}{x}\right)^2 dx = \pi \int_1^2 \frac{1}{x^2} dx = \pi \left[-\frac{1}{x}\right]_1^2 = \pi \left[-\frac{1}{2} - (-1)\right] = \frac{\pi}{2}$$



2. A cross-section is a disk with radius  $e^x$ , so its area is  $A(x) = \pi(e^x)^2$ .

$$V = \int_0^1 A(x) dx = \int_0^1 \pi(e^x)^2 dx = \pi \int_0^1 e^{2x} dx = \frac{1}{2}\pi [e^{2x}]_0^1 = \frac{\pi}{2}(e^2 - 1)$$



3. A cross-section is a disk with radius  $\sqrt{y}$ , so its area is  $A(y) = \pi(\sqrt{y})^2$ .

$$V = \int_0^4 A(y) dy = \int_0^4 \pi(\sqrt{y})^2 dy = \pi \int_0^4 y dy = \pi \left[\frac{1}{2}y^2\right]_0^4 = 8\pi$$

