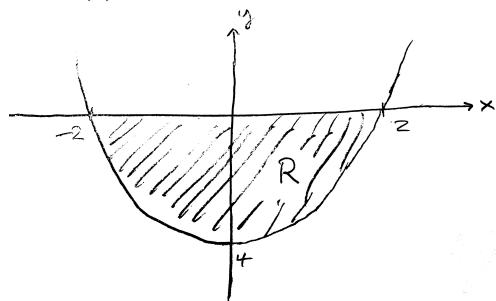


Solutions to Quiz # 2

1. (a)



(b)

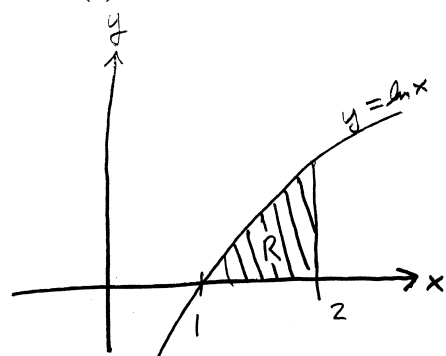
$$A = \int_{-2}^2 0 - (x^2 - 4) dx = 2 \int_0^2 4 - x^2 dx$$

$$= 2 \left[4x - \frac{x^3}{3} \right]_0^2 = \frac{32}{3}$$

(c)

$$V = \int_{-2}^2 \pi r(x)^2 dx = \pi \int_{-2}^2 (x^2 - 4)^2 dx$$

2. (a)

(b) Note the curve is also $x = e^y$. Thus

$$V = \int_0^{\ln 2} \pi (r_{\text{outer}})^2 - \pi (r_{\text{inner}})^2 dy$$

$$= \pi \int_0^{\ln 2} 2^2 - (e^y)^2 dy = \pi \int_0^{\ln 2} 4 - e^{2y} dy$$

$$= \pi \left[4y - \frac{1}{2} e^{2y} \right]_0^{\ln 2} = \pi \left(4 \ln 2 - \frac{1}{2} e^{2 \ln 2} \right)$$

$$= \pi (4 \ln 2 - 2)$$