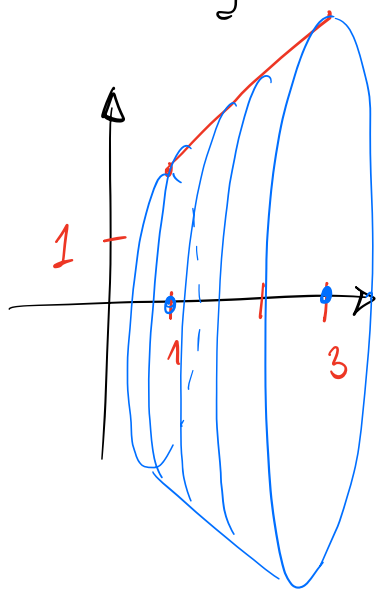


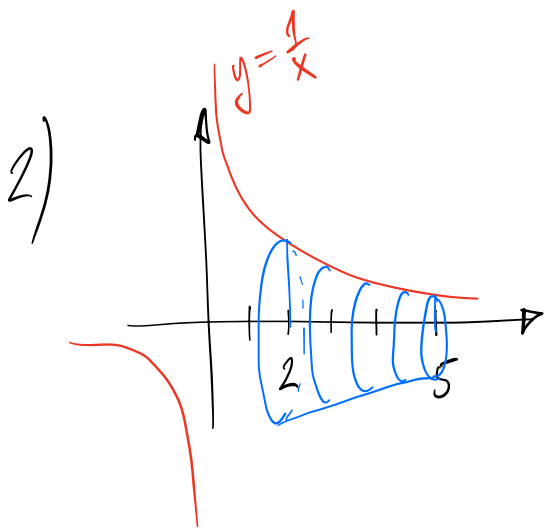
$$1) \pi \cdot \int_1^3 f(x) \cdot dx = \pi \int_1^3 (x+1)^2 dx$$



$$= \pi \cdot \int_1^3 (x^2 + 2x + 1) dx$$

$$= \pi \cdot \left(\frac{1}{3}x^3 + x^2 + x \right) \Big|_1^3 = \pi \cdot \left(\frac{1}{3}27 + 9 + 3 - \frac{1}{3} - 1 - 1 \right)$$

$$= \pi \cdot \left(9 + 9 + 3 - 2 - \frac{1}{3} \right) = \pi \cdot \left(19 - \frac{1}{3} \right) = \pi \cdot \frac{56}{3}$$



$$\pi \int_2^5 f(x) dx = \pi \int_2^5 \frac{1}{x^2} dx$$

$$= \pi \int_2^5 x^{-2} dx$$

$$= \pi \frac{1}{-2+1} x^{-1} \Big|_2^5$$

$$= \pi \left(-\frac{1}{5} + \frac{1}{2} \right) = \frac{3\pi}{10}$$

$$3) \quad \pi \int_0^{2\pi} f^2(x) dx = \pi \int_0^{2\pi} (2 + \sin x)^2 dx$$

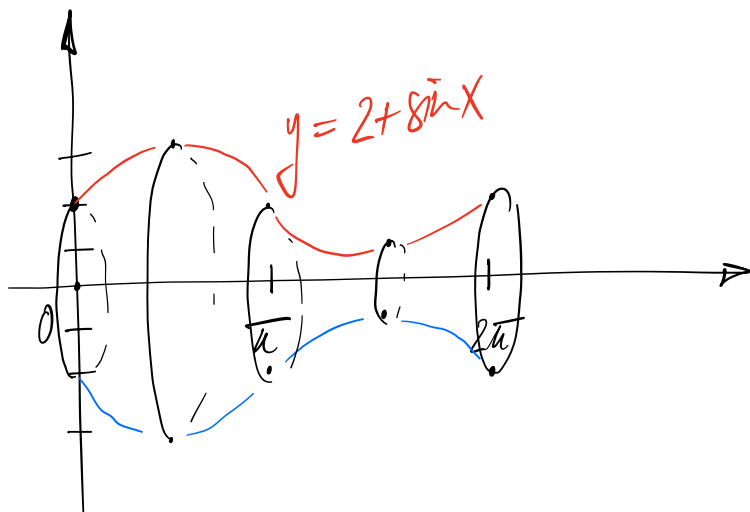
$$= \pi \int_0^{2\pi} (4 + 2 \cdot 2 \sin x + \sin^2 x) dx$$

$$= \pi \int_0^{2\pi} (4 + 4 \sin x + \sin^2 x) dx$$

$$= \pi \left(4x - 4 \cos x + \frac{1}{2} (x - \sin x \cos x) \right) \Big|_0^{2\pi}$$

$$= \pi \left(8\pi - 4 + \frac{1}{2} (2\pi - 0 \cdot 1) - (-4) \right)$$

$$= \pi (8\pi - 4 + \pi + 4) = 9\pi^2$$



$$4) \quad \overline{\pi} \int_a^b f^2(x) dx = \overline{\pi} \int_0^h m^2 x^2 dx$$

$$= \overline{\pi} m^2 \cdot \int_0^h x^2 dx = \overline{\pi} m^2 \cdot \frac{1}{3} x^3 \Big|_0^h$$

$$= \overline{\pi} m^2 \cdot \frac{h^3}{3} = \frac{\overline{\pi} m^2 h^3}{3}$$

