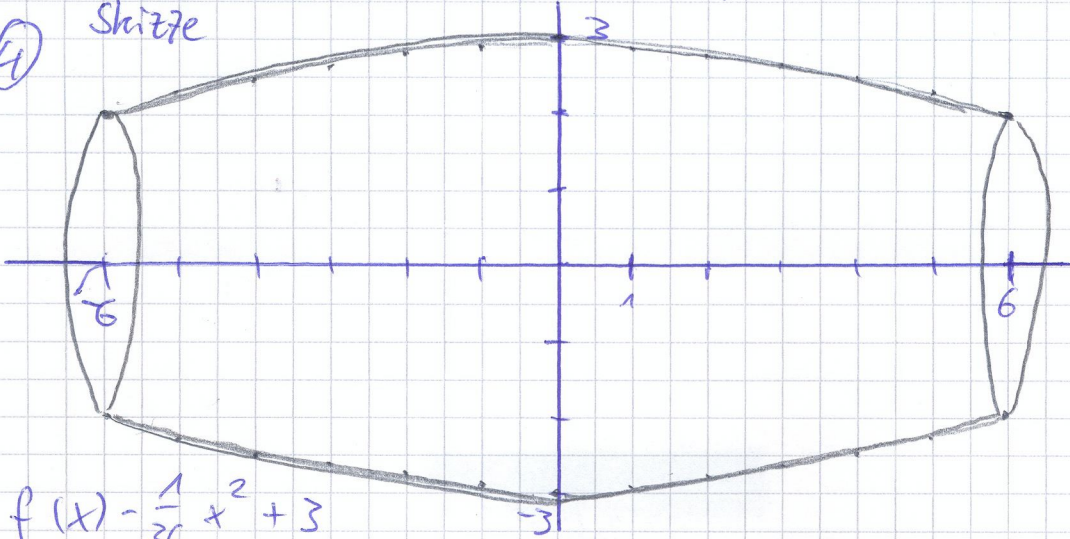


Analysis - Aufgabe 4

④ Skizze



$$f(x) = -\frac{1}{36}x^2 + 3$$

$$\text{allg.: } \pi \int_a^b f^2(x) dx$$

$$V = 2 \cdot \pi \int_0^6 \left(-\frac{1}{36}x^2 + 3\right)^2 dx$$

$$= 2 \cdot \pi \cdot \int_0^6 \left(-\frac{1}{36}x^2 + 3\right) \cdot \left(-\frac{1}{36}x^2 + 3\right) dx$$

$$= 2 \cdot \pi \cdot \int_0^6 \left(\frac{1}{1296}x^4 - \frac{1}{12}x^2 - \frac{1}{12}x^2 + 9\right) dx$$

$$= 2 \cdot \pi \cdot \int_0^6 \left(\frac{1}{1296}x^4 - \frac{1}{6}x^2 + 9\right) dx$$

$$= 2 \cdot \pi \cdot \left[\frac{1}{5} \cdot \frac{1}{1296}x^5 - \frac{1}{3} \cdot \frac{1}{6}x^3 + 9x \right]_0^6$$

$$= 2 \cdot \pi \cdot \left[\frac{1}{6480}x^5 - \frac{1}{18}x^3 + 9x \right]_0^6$$

$$= 2 \cdot \pi \cdot \left[\frac{1}{6480} \cdot 6^5 - \frac{1}{18} \cdot 6^3 + 9 \cdot 6 \right] = \frac{432}{5} \pi$$

$$\frac{432}{5} \pi = 271.433 \text{ dm}^2 = \underline{\underline{271.433 \text{ l}}}$$

Armin + Tilman