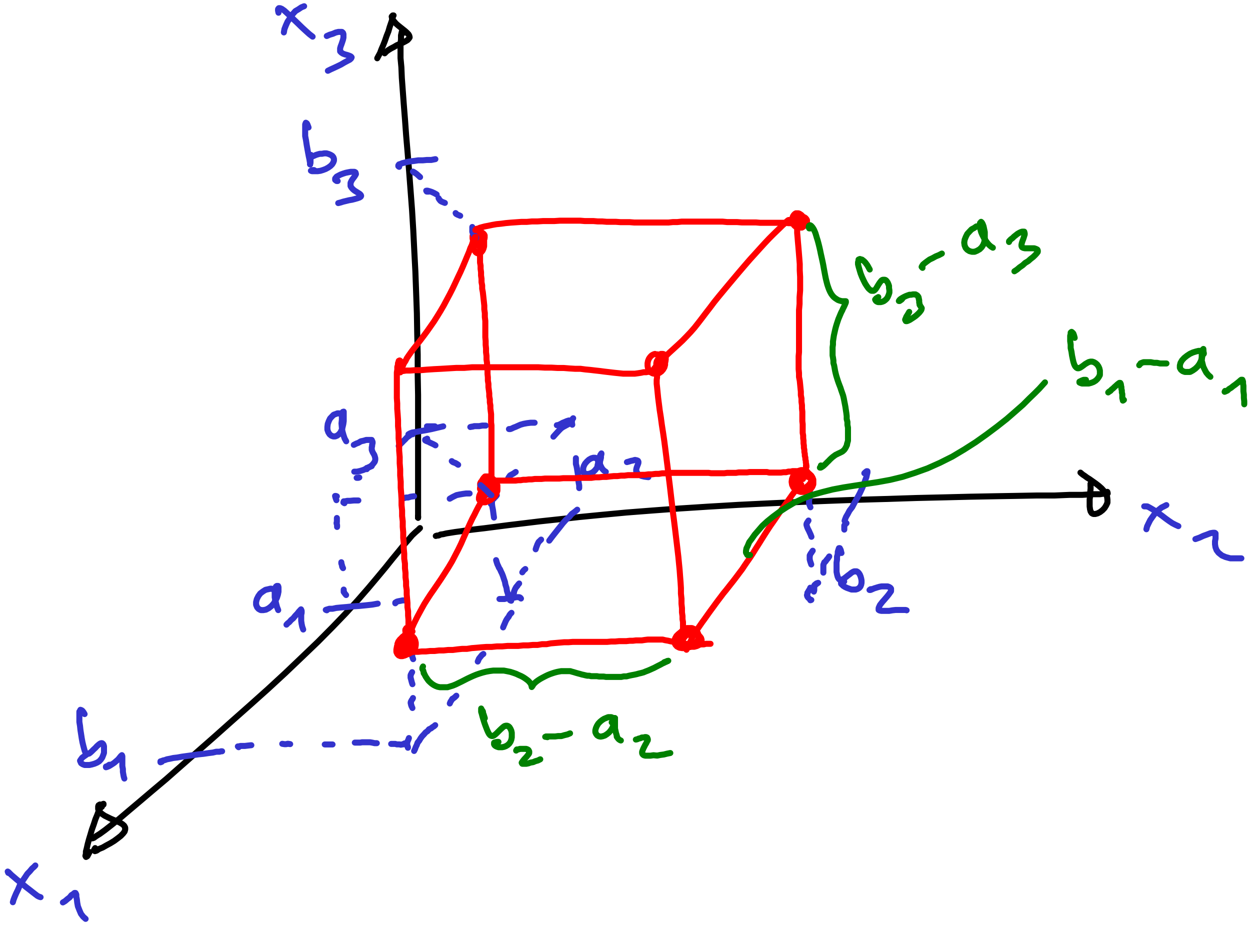
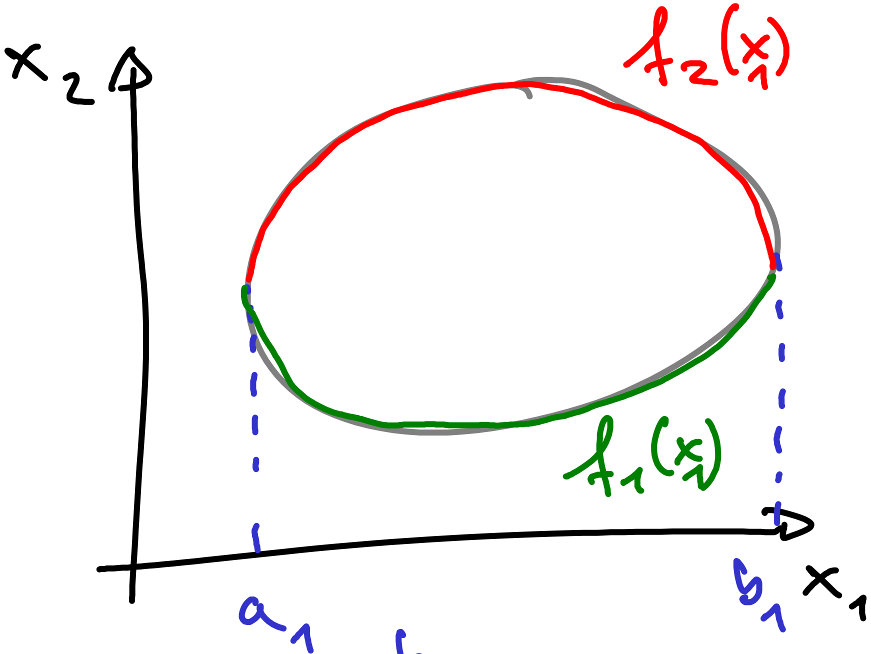
$\sqrt{3}\,\log 5$ ist ein schönes Ergebnis

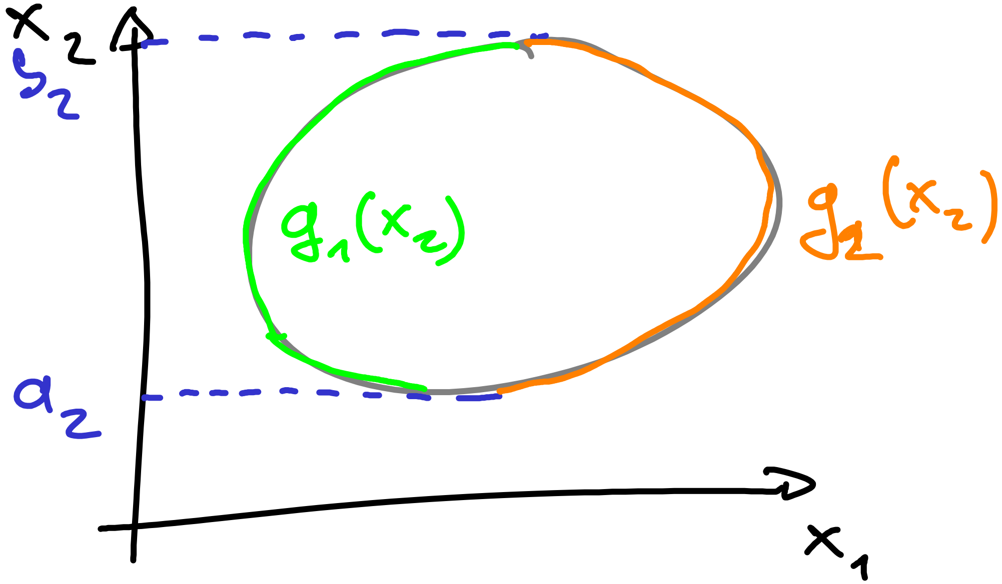
$\frac{1}{2}\,\log(16)$ ist noch nicht ganz perfekt

$$= \frac{1}{2}\log(2^4) = \frac{4}{2}\log 2 = 2\log 2$$

$$K = [a_1, b_1] \times [a_2, b_2] \times [a_3, b_3]$$







$$\text{Fläche} = \int_{a_1}^{b_1} \Big(\underbrace{f_2(x_1) - f_1(x_1)}_{\int_{f_1(x_1)}^{f_2(x_1)} 1 \cdot dx_2 \, = \, \left[x_2 \right]_{x_2 = f_1(x_1)}^{x_2 = f_2(x_1)}} \Big) \, dx_1$$

$$= \int_{a_1}^{b_1} \int_{f_1(x_1)}^{f_2(x_1)} dx_2 \, dx_1$$

ebenso gilt

$$\text{Fläche} = \int_{a_2}^{b_2} \underbrace{\left(g_2(x_2) - g_1(x_2) \right)}_{=} dx_2$$

$$= \int_{a_2}^{b_2} \int_{g_1(x_2)}^{g_2(x_2)} dx_1 \, dx_2$$

Volumen unter Parabeldach

$$z(x,y) = 2 - x^2 - y^2$$

hier muß z-Int. zuerst ausgeführt werden, da Grenze von x und y abhängt (rechentechnisch Bem.)

$$V = \int_{-1}^{1} \int_{-1}^{1} \int_{0}^{2-x^2-y^2} 1 \, dz \, dy \, dx$$

Stammfkt.

$$= \int_{-1}^{1} \int_{-1}^{1} \left[z \right]_{0=z}^{2-x^2-y^2=z} dy \, dx$$

$$= \int_{-1}^{1} \int_{-1}^{1} (2 - x^2 - y^2) \, dy \, dx$$

$$= \int_{-1}^{1} \left[2y - x^2 y - \frac{y^3}{3} \right]_{-1=y}^{1=y} dx$$

$$= \int_{-1}^{1} \left(2 - x^2 - \frac{1}{3} - \left(-2 + x^2 + \frac{1}{3}\right)\right) dx$$

$$= \int_{-1}^{1} \left(\frac{10}{3} - 2x^2\right) dx$$

$$= \left[\frac{10}{3}x - \frac{2}{3}x^3\right]_{-1=x}^{1=x}$$

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

$$= \frac{16}{3}$$

inhomogene Würfel

$$m = \int_0^1 \int_0^1 \int_0^1 (1 - z + xy)\, dz\, dy\, dx$$

$$= \int_0^1 \int_0^1 \left[z - \frac{1}{2} z^2 + xyz \right]_{0=z}^{1=z} dy\, dx$$

$$= \int_0^1 \int_0^1 \Big(\underbrace{1 - \frac{1}{2}}_{=1/2} + xy \Big)\, dy\, dx$$

$$= \int_0^1 \left[\frac{1}{2} y + \frac{x}{2} y^2 \right]_{0=y}^{1=y} dx$$

$$= \int_0^1 \left(\frac{1}{2} + \frac{x}{2} \right) dx = \left[\frac{1}{2} x + \frac{x^2}{4} \right]_{0=x}^{1=x}$$

$$= 3/4$$