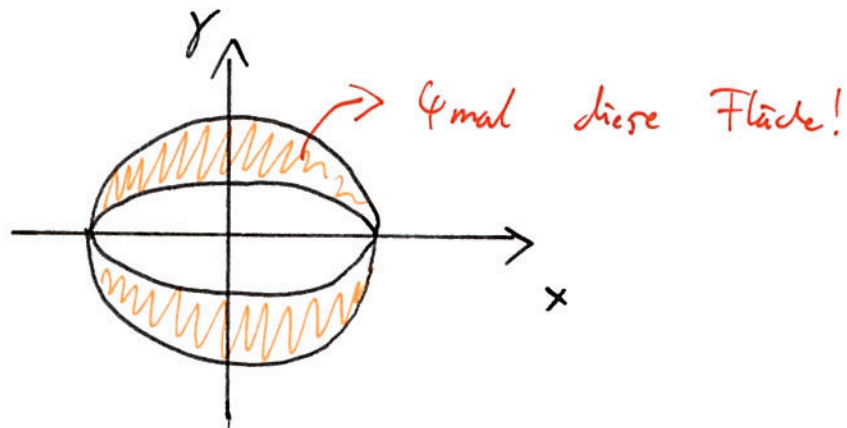


A17

$$B := \left\{ (x, y) \mid \underbrace{1 \leq x^2 + 4y^2}_{\text{Ellipse}}, \underbrace{x^2 + y^2 \leq 1}_{\text{Kreis}} \right\}$$



$$I = \int_B (|x| + |y|) d(x, y) = 4 \cdot \int_0^1 \left(\int_{\frac{1}{2}\sqrt{1-x^2}}^{\sqrt{1-x^2}} (x+y) dy \right) dx$$

$$= 4 \cdot \int_0^1 x \cdot y + \frac{1}{2} y^2 \Big|_{\frac{1}{2}\sqrt{1-x^2}}^{\sqrt{1-x^2}} \quad \begin{array}{l} \text{rechnen!} \\ \downarrow \\ = 4 \cdot \frac{5}{12} \end{array}$$

oder mit Fubini genau anders herum:

$$I = 4 \cdot \int_0^{1/2} \left(\int_{\sqrt{1-4y^2}}^{\sqrt{1-y^2}} (x+y) dx \right) dy$$

$$= 4 \cdot \int_0^{1/2} \frac{1}{2} x^2 + x \cdot y \Big|_{\sqrt{1-4y^2}}^{\sqrt{1-y^2}} dy \quad \begin{array}{l} \text{rechnen!} \\ \downarrow \\ = 4 \cdot \frac{5}{12} \end{array}$$