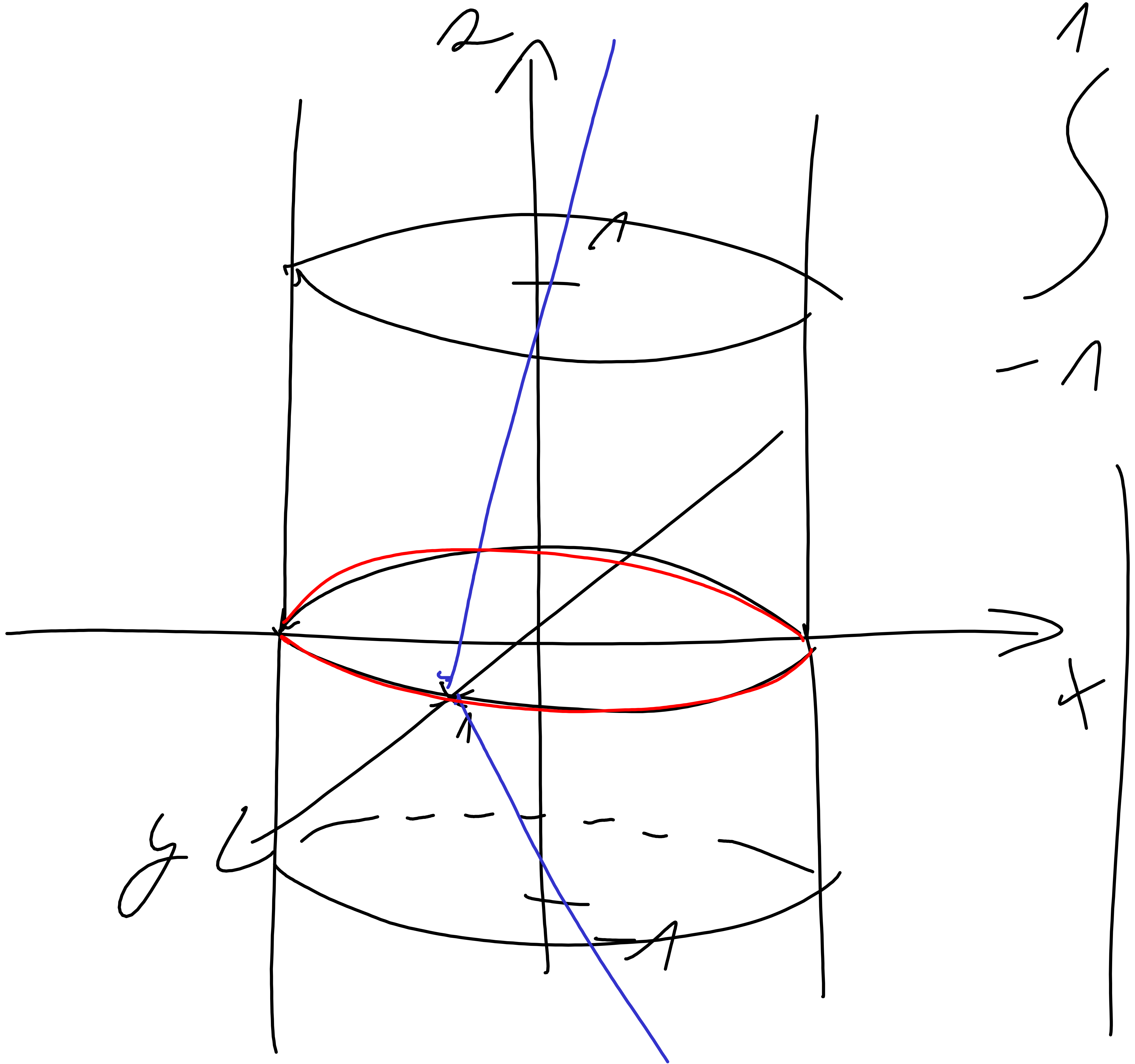

$$\int_{-1}^{1}\int_{-\sqrt{1-x^2}}^{+\sqrt{1-x^2}}\int_{x-1}^{1-x} x^2+y^2 \, dz \, dy \, dx =$$

$$= \dots = \pi$$

$$= \int_0^1 \int_0^{2\pi} \rho^3 \cdot \left[z \right]_{\rho \cdot \cos\varphi - 1}^{1 - \rho \cdot \cos\varphi} \, d\varphi \, d\rho =$$

$$= \int_0^1 \int_0^{2\pi} \rho^3 \cdot \left(2 - 2 \cdot \rho \cdot \cos\varphi \right) d\varphi \, d\rho = 2 \cdot \int_0^1 \rho^3 \cdot \left[\varphi - \rho \cdot \cancel{\sin\varphi} \right]_0^{2\pi} d\rho$$

$$= 2 \cdot \int_0^1 2\pi \cdot \rho^3 \, d\rho = 4\pi \cdot \left[\frac{\rho^4}{4} \right]_0^1 = 4\pi \cdot \frac{1}{4} = \pi$$

$$\left.\begin{aligned} u &= y - x \\ v &= y - 2x \end{aligned}\right\} \Rightarrow \boxed{\begin{aligned} x &= u - v \\ y &= 2u - v \end{aligned}} \qquad J(u,v) = \begin{vmatrix} x_u & x_v \\ y_u & y_v \end{vmatrix} =$$

$$= \begin{vmatrix} 1 & -1 \\ 2 & -1 \end{vmatrix} = -1 + 2 = 1$$

$\underline{v}$: $x = 0 \ \ldots \ y = 0 \implies v = x, \ v \in [0, ?]$

$? \longrightarrow y = 0, \ u = y - x$

$u = -x$

$x = -u \implies ? = -u$

$$\frac{x+y}{x-y} = \frac{v+u+v}{v-u-v} = \frac{u+2v}{-u}$$

$$\text{Int.} = \int_{-2}^{-1} \int_{0}^{-u} e^{\frac{u+2v}{-u}} \cdot 1 \, dv \, du = \ldots \Rightarrow \frac{3 \cdot (e^2-1)}{4e}$$

$$-1-2 \cdot \frac{v}{u}$$

$$y = \frac{u}{x}, \quad y = v \cdot x \implies \underbrace{u = x \cdot y, \quad v = \frac{y}{x}}_{}$$

$$u \in \left[\frac{1}{2}, 2\right], \quad v \in \left[\frac{1}{2}, 2\right]$$

$$\implies x = \sqrt{\frac{u}{v}}, \quad y = \sqrt{u \cdot v}$$

$$J(x,y) = \begin{vmatrix} u_x & u_y \\ v_x & v_y \end{vmatrix} = \begin{vmatrix} y & x \\ -\frac{y}{x^2} & \frac{1}{x} \end{vmatrix} = \frac{y}{x} + \frac{y}{x} = 2 \cdot \frac{y}{x}$$

$$J(u,v) = J^{-1}(x,y) = \frac{1}{2} \cdot \frac{x}{y} = \frac{1}{2} \cdot \frac{x}{vx} = \frac{1}{2v}$$

$$x^2 y^2 = \frac{u}{\cancel{v}} \cdot u \cdot \cancel{v} = u^2$$

$$\int_{1/2}^{2} \int_{1/2}^{2} u^2 \cdot \frac{1}{2v} \, dv \, du = \ldots = \underline{\underline{\frac{63}{24} \cdot \ln 2}}$$