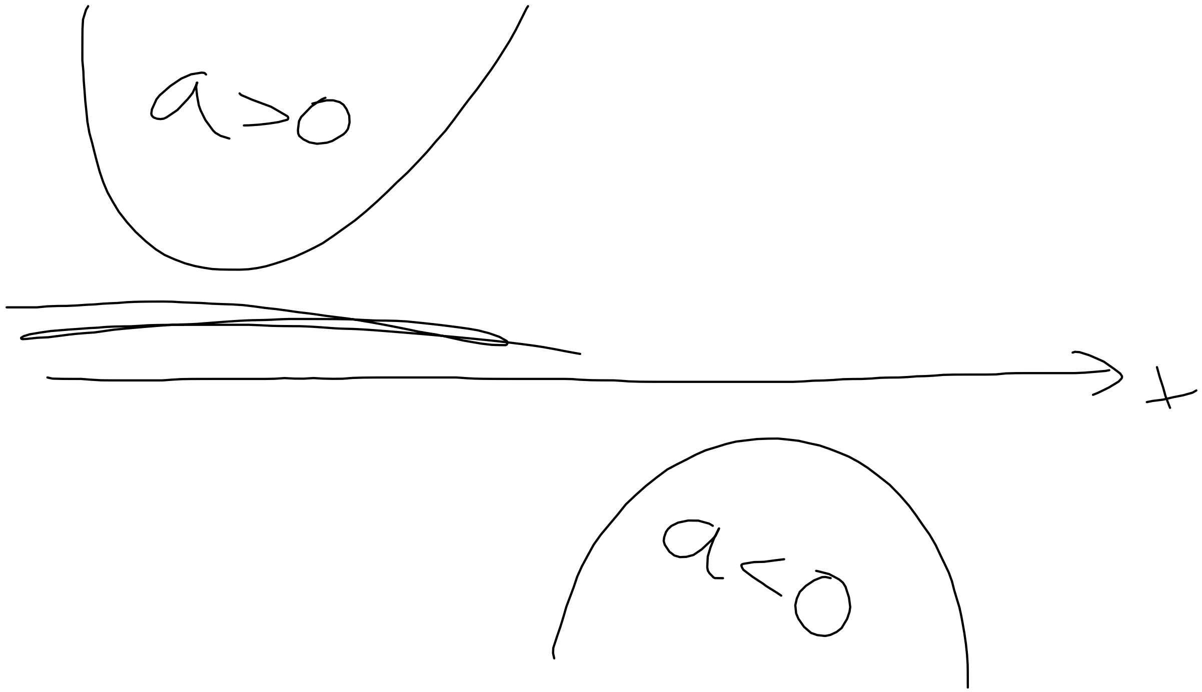
$$\int \frac{\cos x}{\sqrt{1+\sin^2 x}}\,dx = \left|\begin{array}{l} t=\sin x \\ dt=\cos x\,dx \end{array}\right| = \int \frac{dt}{\sqrt{1+t^2}} =$$

$$= \int (1+t^2)^{-\frac{1}{2}}\,dt = \left|\begin{array}{l} \boxed{u=t+\sqrt{1+t^2}} \\ du=\left(1+\frac{t}{\sqrt{1+t^2}}\right)dt \end{array}\right| =$$

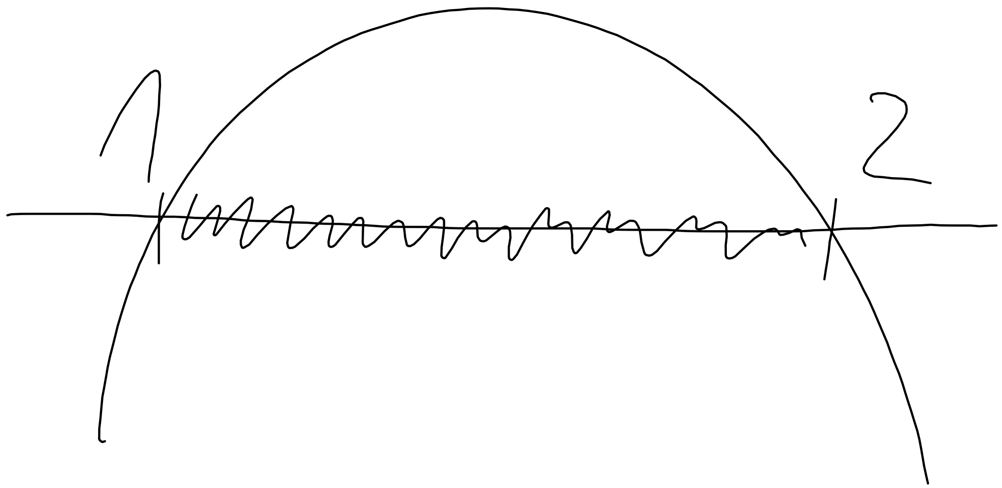

a>0
x
a<0

$$\cancel{x^2} - x + 1 = \cancel{x^2} - 2xt + t^2$$

$$2xt - x = t^2 - 1$$

$$x = \frac{t^2 - 1}{2t - 1}$$

$$I = \int \frac{1}{\cancel{\frac{t^2-1}{2t-1}} = \cancel{\frac{t^2-1}{2t-1}} + t} \cdot \frac{2 \cdot (t^2 - t + 1)}{(2t-1)^2}\, dt$$


1
2

$$\sqrt{x^2-\alpha^2} = \sqrt{\frac{\alpha^2}{\sin^2 t} - \alpha^2} =$$

$$= \alpha \cdot \sqrt{\frac{1}{\sin^2 t} - 1} = \alpha \cdot \sqrt{\frac{1-\sin^2 t}{\sin^2 t}} = \alpha \cdot \left|\frac{\cos t}{\sin t}\right|$$

$$a^2 - x^2 = a^2 - a^2 \cdot \sin^2 t = a^2 \cdot \cos^2 t$$

$$a^2 + x^2 = a^2 + a^2 \cdot \operatorname{tg}^2 t = a^2 \cdot \left(1 + \frac{\sin^2 t}{\cos^2 t}\right) =$$

$$= a^2 \cdot \frac{\cos^2 t + \sin^2 t}{\cos^2 t} = \frac{a^2}{\cos^2 t}$$

a) $a^2 - x^2 = t^2 \Longrightarrow x^2 = a^2 - t^2$

$-2x\,dx = 2t\,dt$

$x\,dx = -t\,dt$

$$\int \frac{1}{\cos^2 t}\,dt = \left|\begin{array}{l} u = \sin t \\ du = \cos t\,dt \end{array}\right| = \int \frac{\cos t}{\cos^4 t}\,dt = \ldots$$

$$\frac{\cos t}{\cos^4 t}\,dt \to du$$

$$\cos^4 t \to (\cos^2 t)^2 = (1-\sin^2 t)^2 = (1-u^2)^2$$

$$\int x^m \cdot (a+bx^n)^p \, dx$$

$$\frac{m+1}{n} = \frac{0+1}{4} = \frac{1}{4}$$

$$\frac{m+1}{n} + p = \frac{1}{4} - \frac{1}{4} = 0 \in \mathbb{Z}$$

$$x^{-4} + 1 = t^4$$

$$x^{-4} = t^4 - 1$$

$$x^4 = \frac{1}{t^4 - 1}$$

$$\frac{1}{\sqrt[4]{1 + \frac{1}{t^4 - 1}}} = \frac{1}{\sqrt[4]{\frac{t^4 \cancel{- 1 + 1}}{t^4 - 1}}} =$$

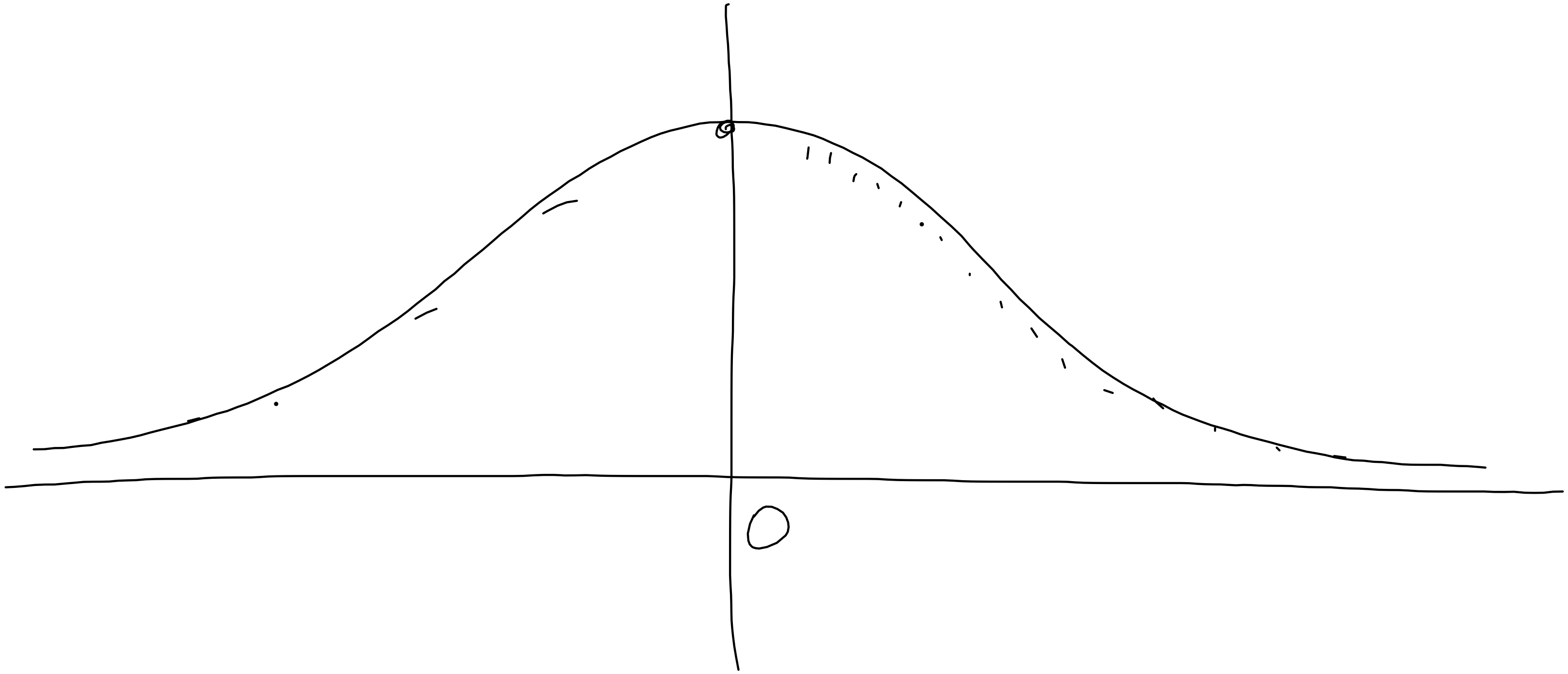
$$= \frac{1}{\frac{t}{\sqrt[4]{t^4 - 1}}}$$

$$\int \frac{\cancel{(t^4-1)^{1/4}}}{t} \cdot \frac{-t^3}{(t^4-1)^{\cancel{5/4}}}\, dt$$

$$\frac{4}{4} = 1$$

$$\int \cos^2 x \, dx$$

$$\int \frac{x}{\ln x} dx \qquad \Bigg\| \qquad \int \frac{\ln x}{x} dx = \left| \begin{array}{l} t = \ln x \\ dt = \frac{1}{x} dx \end{array} \right| = \int t \, dt = \frac{\ln^2 x}{2} + C$$


0

$$\int_0^\infty e^{-x^2}\,dx \cdot \int_0^\infty e^{-y^2}\,dy =$$

$$= \int_0^\infty \left(\int_0^\infty e^{-x^2-y^2}\,dy \right) dx = \text{(POLÁRNÍ SOUŘ.)}$$