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

$$= \left| \begin{array}{l} u = t + \sqrt{1+t^2} \\ du = 1 + \frac{1}{2}\cdot\frac{1}{\sqrt{1+t^2}}\cdot 2t \, dt = 1 + \frac{t}{\sqrt{1+t^2}}\,dt = \frac{\sqrt{1+t^2}+t}{\sqrt{1+t^2}}\,dt \end{array} \right| = \int \frac{1}{u}\,du = \ln|u| + C =$$

$\sqrt{1+t^2}+t \to u$

$$\frac{1}{u}\,du = \frac{1}{\sqrt{1+t^2}}\,dt$$

$$= \ln\left|t + \sqrt{1+t^2}\right| + C$$

$$= \ln\left|\sin x + \sqrt{1+\sin^2 x}\right| + C$$

$$(*) = \int (1+t^2)^{-\frac{1}{2}}\, dt = \left| \begin{array}{l} t^m \cdot (a+bt^n)^p \Rightarrow m=0,\ n=2,\ p=-\frac{1}{2} \\ p \notin \mathbb{Z},\ \frac{m+1}{n} = \frac{1}{2} \notin \mathbb{Z},\ \frac{m+1}{n} - p = 0 \in \mathbb{Z} \Rightarrow 1\cdot t^{-2} + 1 = u^2 \\ \qquad t^{-2} = u^2 - 1 \\ \qquad t^2 = \frac{1}{u^2-1} \\ \qquad t = \frac{1}{\sqrt{u^2-1}} \\ 1\,dt = -\frac{1}{2}\cdot(u^2-1)^{-\frac{3}{2}} \cdot 2u\,du \\ \boxed{dt = \frac{-u}{(u^2-1)^{3/2}}\,du} \end{array} \right| =$$

$$= \int \frac{1}{\sqrt{1+\frac{1}{u^2-1}}} \cdot \frac{-u}{(u^2-1)^{3/2}}\,du = -\int \frac{1}{\sqrt{\frac{u^2-1+1}{u^2-1}}} \cdot \frac{u}{(u^2-1)^{3/2}}\,du =$$

$$= -\int \frac{\cancel{\sqrt{u^2-1}}}{\cancel{u}} \cdot \frac{\cancel{u}}{(u^2-1)\cdot\cancel{\sqrt{u^2-1}}}\,du = -\int \frac{1}{u^2-1}\,du = -\int \frac{1}{(u-1)\cdot(u+1)}\,du =$$

$$= -\int \frac{\frac{1}{2}}{u-1} - \frac{\frac{1}{2}}{u+1}\,du = -\frac{1}{2}\cdot\int \frac{1}{u-1} - \frac{1}{u+1}\,du =$$

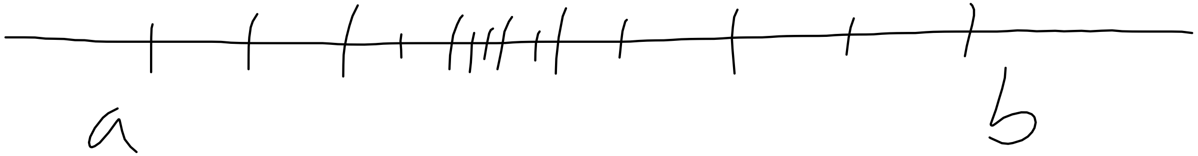
$$= -\frac{1}{2}\cdot\left(\ln|u-1| - \ln|u+1|\right) + C = -\frac{1}{2}\cdot\ln\left|\frac{u-1}{u+1}\right| + C =$$

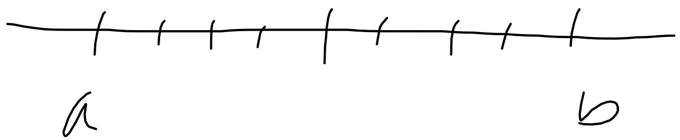
$$= -\frac{1}{2}\cdot\ln\left|\frac{u-1}{u+1}\cdot\frac{u+1}{u+1}\right| + C = -\frac{1}{2}\cdot\ln\left|\frac{u^2-1}{(u+1)^2}\right| + C = -\frac{1}{2}\cdot\ln\left|\frac{\frac{1}{t^2}}{\left(\sqrt{1+\frac{1}{t^2}}+1\right)^{2}}\right| + C =$$

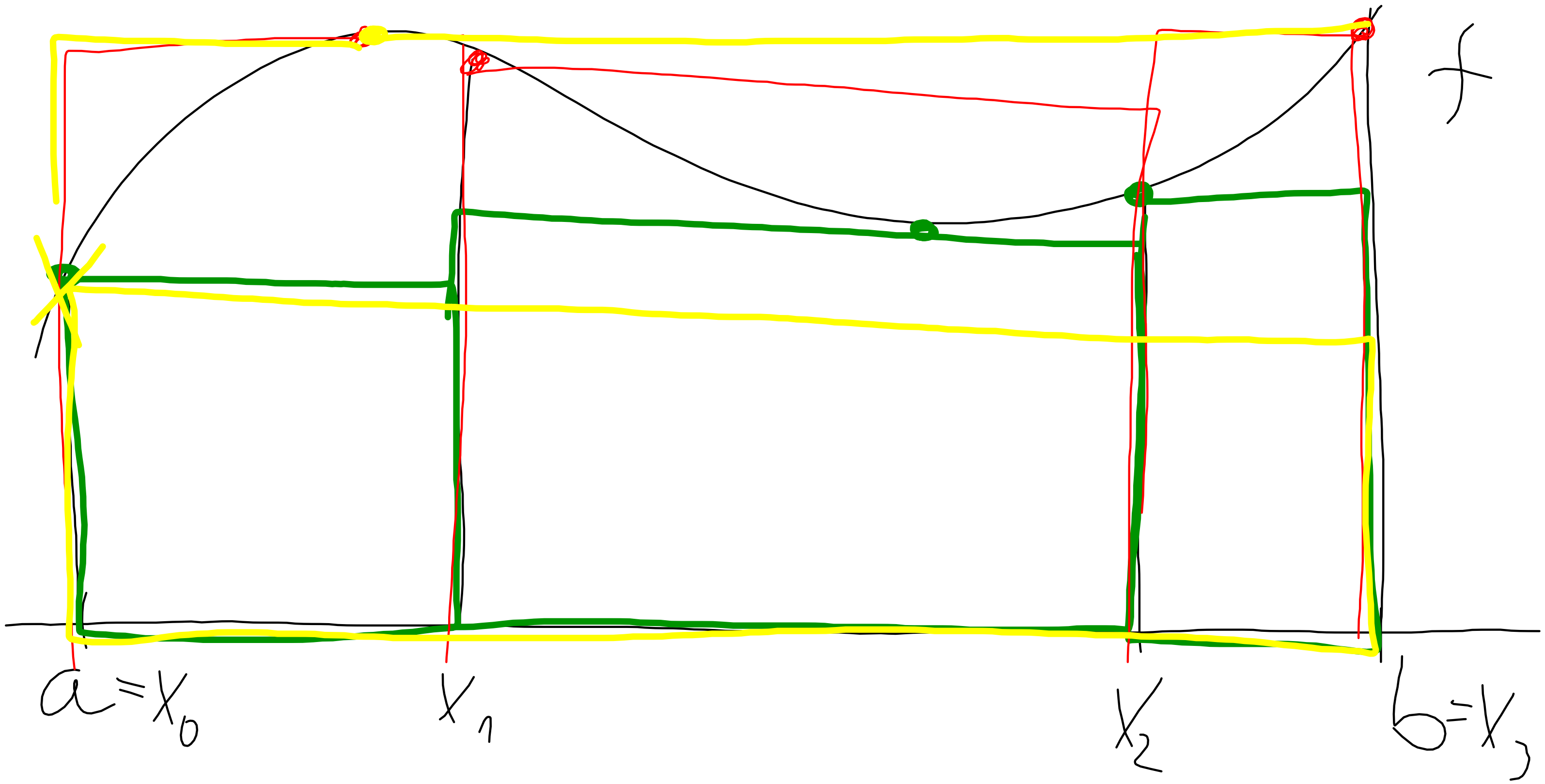
$$= -\frac{1}{2}\cdot\ln\left|\frac{\frac{1}{\cancel{t^2}}}{\frac{\left(\sqrt{t^2+1}+t\right)^2}{\cancel{t^2}}}\right| + C = -\frac{1}{2}\cdot\ln\left|\left(t+\sqrt{1+t^2}\right)^{-2}\right| + C =$$

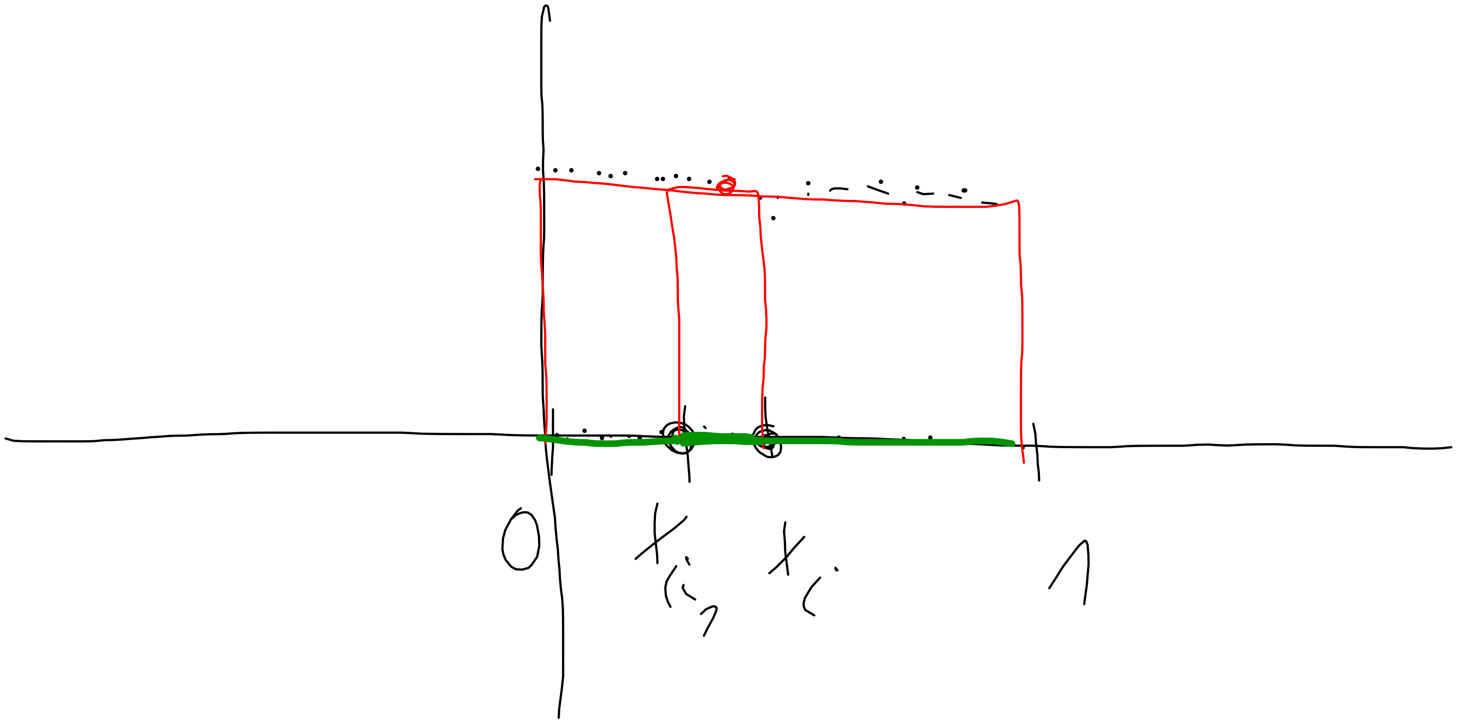
$$= \ln\left|t+\sqrt{1+t^2}\right| + C = \dots$$

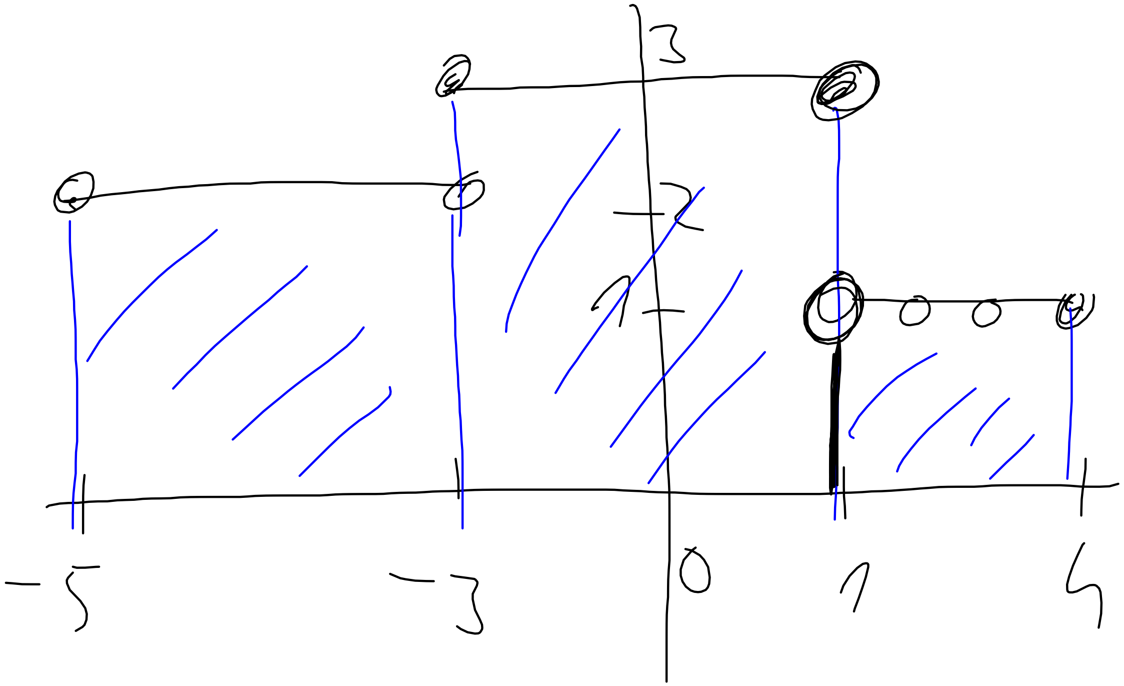
$$\sqrt{\frac{t^2+1}{t^2}}+1 = \frac{\sqrt{t^2+1}}{t}+1 = \frac{\sqrt{t^2+1}+t}{t}$$

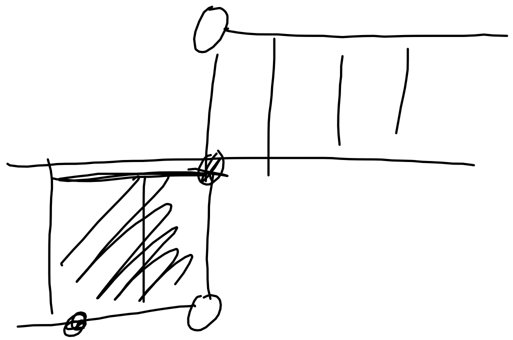

a
b

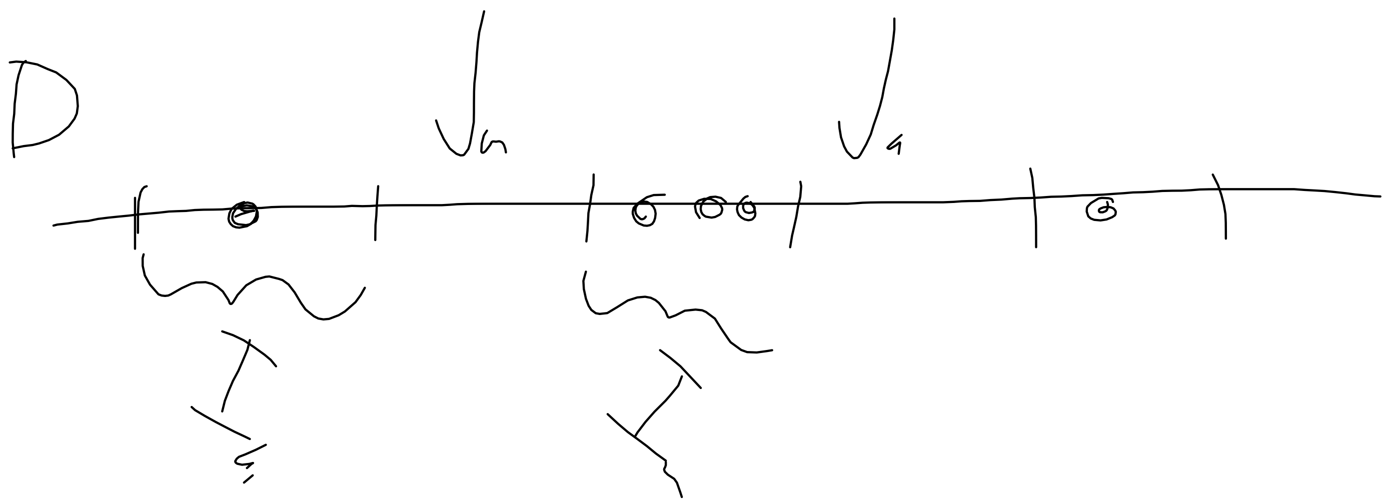

a
b

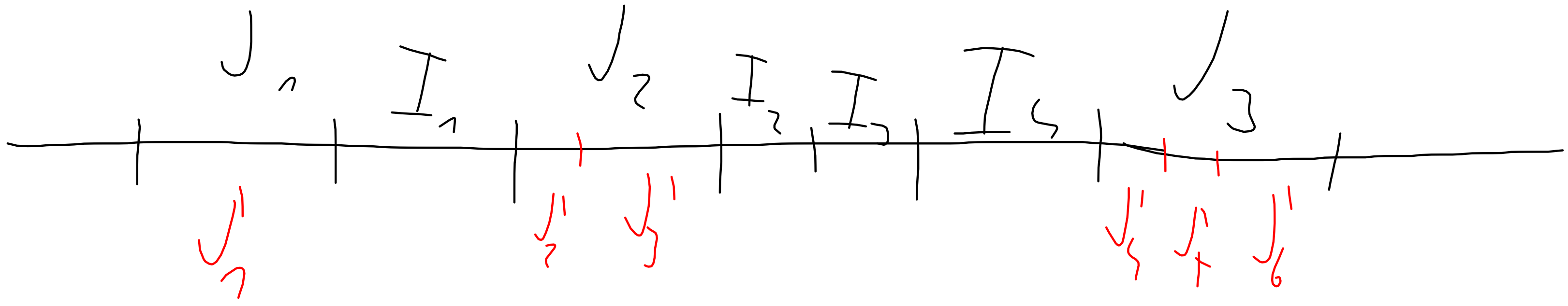

f
a = x_0
x_1
x_2
b = x_3


0
x_{i-1}
x_i
1


3
2
1
-5
-3
0
1
4



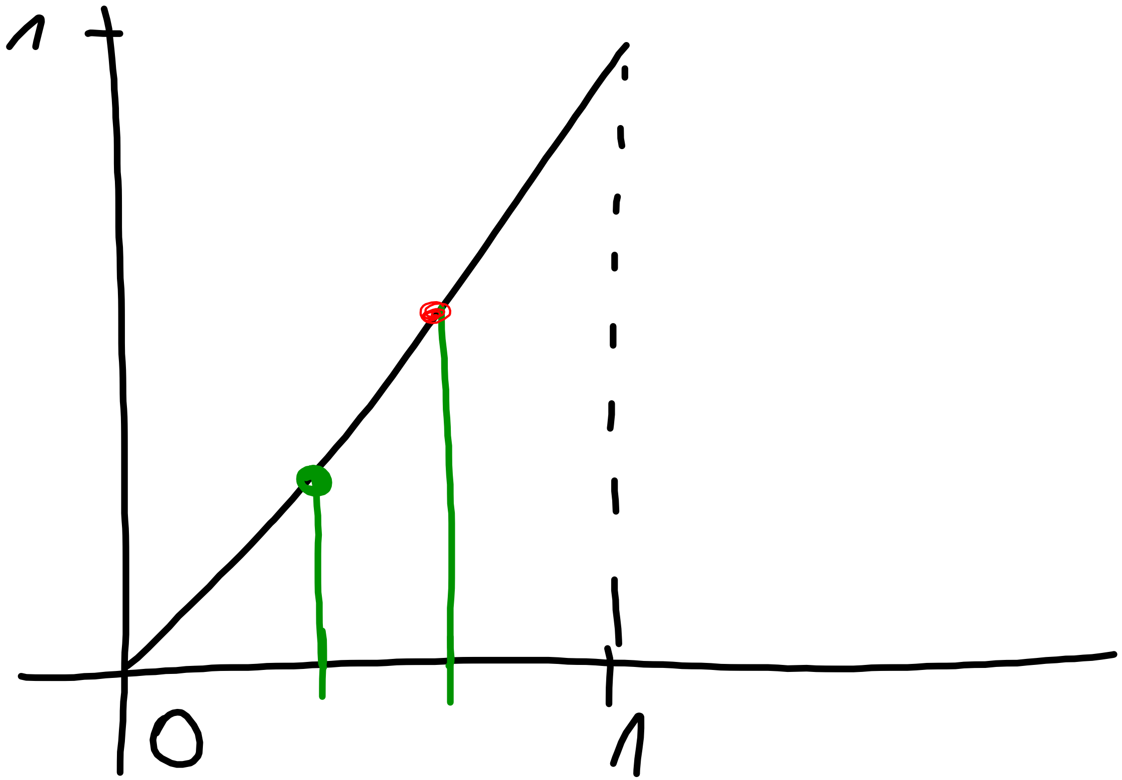



J_1 I_1 J_2 I_2 I_3 I_4 J_3
J'_1 J'_2 J'_3 J'_5 J'_4 J'_6

$$\delta = \frac{\varepsilon}{4Kp}$$

$$2\cancel{K}\cancel{p} \cdot \frac{\varepsilon}{4\cancel{K}\cancel{p}}$$

$$S(D_1) - S(D_2) < 2Kp\delta$$


1
0
1

$$\frac{100 \cdot (1+100)}{2}$$

$1, 2, 3, 4, \ldots, 99, 100$

$100, 99, 98, 97, \ldots, 2, 1$

$101, 101, \ldots, 101$

$$S - s < \varepsilon$$

$$\leq \qquad \geq$$

$$\overline{\int} \qquad \underline{\int} < \varepsilon$$

$$10 - 2$$

$$8 - 5$$