Sp.:

$$\int \sqrt{8t^2+1}\,dt = \int \sqrt{(\sqrt{8}t)^2+1}\,dt = \left| \begin{array}{ll} t := \frac{1}{\sqrt{8}}\sinh x & \cosh^2 x - \sinh^2 x = 1 \\ dt = \frac{1}{\sqrt{8}}\cosh x & \\ x = \operatorname{arsinh}(\sqrt{8}\cdot t) & \end{array} \right| =$$

$$\frac{1}{\sqrt{8}} \int \sqrt{\sinh^2 x + 1}\,\cosh x\,dx = \frac{1}{\sqrt{8}} \int \cosh x \cdot \cosh x\,dx$$

NR:

$$\int \underbrace{\cosh x}_{u'} \cdot \underbrace{\cosh x}_{v} = \sinh x \cosh x - \int \sinh^2 x\,dx = \sinh x \cdot \cosh x - \int (\cosh^2 x - 1)\,dx$$

$$= \sinh x \cdot \cosh x - \int \cosh^2 x + x + C$$

$$\Rightarrow \quad 2\int \cosh^2 x\,dx = \sinh x \cdot \cosh x + x + C$$

$$\Rightarrow \quad \int \cosh^2 x\,dx = \frac{1}{2}\sinh x \cdot \cosh x + \frac{x}{2} + C$$

$$\Rightarrow \quad \frac{1}{\sqrt{8}} \int \cosh^2 x\,dx = \frac{1}{2\cdot\sqrt{8}}\sinh x \cdot \cosh x + \frac{x}{2\sqrt{8}} + C$$

$$= \frac{1}{2\sqrt{8}} \sinh x \sqrt{1+\sinh^2 x} + \frac{x}{2\sqrt{8}} + C$$

$$= \frac{1}{2\sqrt{8}} \sqrt{8}\cdot t \sqrt{1+8t^2} + \frac{\operatorname{arsinh}(\sqrt{8}\cdot t)}{2\sqrt{8}} + C$$

$x = \operatorname{arsinh}(\sqrt{8}t)$

$$\operatorname{arsinh} x = \ln\left(x + \sqrt{x^2+1}\right)$$

$$\Rightarrow \quad \int_0^1 \sqrt{8t^2+1}\,dt = \left[\frac{t}{2}\cdot\sqrt{1+8t^2} + \frac{\operatorname{arsinh}(\sqrt{8}\cdot t)}{2\sqrt{8}} \right]_0^1 =$$

$$= \frac{1}{2} \cdot 3 + \frac{\operatorname{arsinh}(\sqrt{8})}{2\sqrt{8}} \approx \underline{\underline{1{,}8111}}$$