Neurčitý integrál $\int \operatorname{arctg} \sqrt{8x-1}\, dx$

$$= \left| \begin{array}{l} \sqrt{8x-1} = t \quad /^2 \\ 8x-1 = t^2 \\ 8dx = 2t\,dt \\ dx = \frac{1}{4} t\, dt \end{array} \right| = \int \operatorname{arctg}(t) \cdot \frac{1}{4} t\, dt = \left| \begin{array}{ll} u' = \frac{t}{4} & v = \operatorname{arctg} t \\ u = \frac{1}{4} \cdot \frac{t^2}{2} & v' = \frac{1}{1+t^2} \end{array} \right| =$$

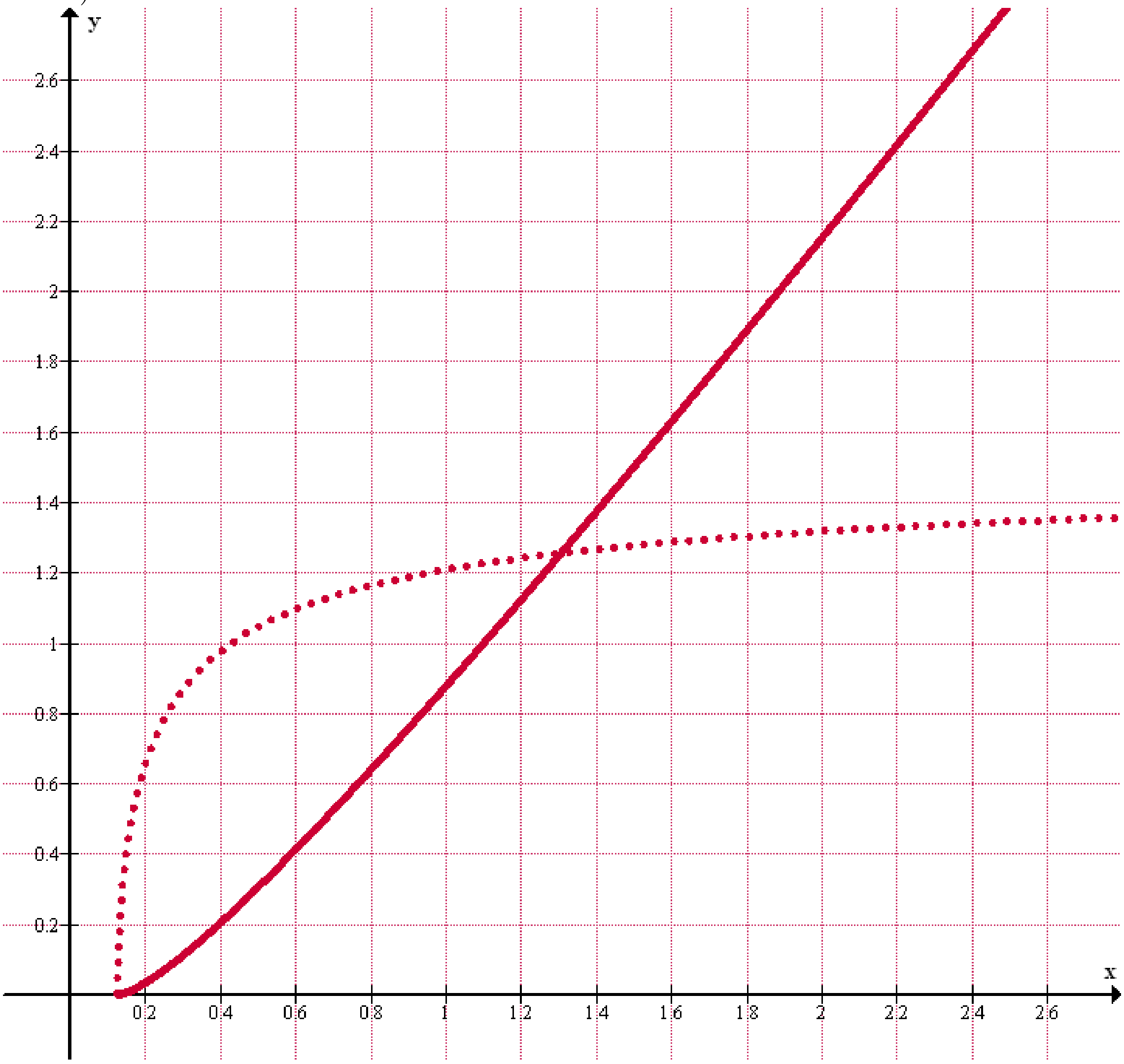
$$= \frac{t^2}{8} \operatorname{arctg} t - \int \frac{t^2}{8} \cdot \frac{1}{1+t^2}\, dt = \frac{t^2}{8} \operatorname{arctg} t - \frac{1}{8} \int \frac{t^2}{1+t^2}\, dt = \frac{t^2}{8} \operatorname{arctg} t -$$

$$- \frac{1}{8} \int \frac{(t^2+1)-1}{(t^2+1)}\, dt = \frac{t^2}{8} \operatorname{arctg} t - \frac{1}{8} \int 1\, dt + \frac{1}{8} \int \frac{1}{t^2+1}\, dt =$$

$$= \frac{t^2}{8} \operatorname{arctg} t - \frac{1}{8} t + \frac{1}{8} \operatorname{arctg} t = \frac{8x-1}{8} \operatorname{arctg} \sqrt{8x-1} - \frac{1}{8} \sqrt{8x-1} +$$

$$+ \frac{1}{8} \operatorname{arctg} \sqrt{8x-1} = \underline{x \operatorname{arctg} \sqrt{8x-1} - \frac{1}{8} \sqrt{8x-1} + C}$$

OBRÁZEK 1. Grafické znázornění funkce (tečkovaná) a jejího integrálu (plná čára) s nulovou konstantou



Zdroj: program Graph