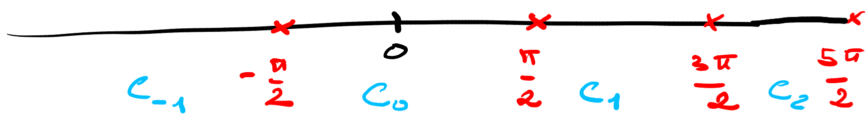
$$\int \underbrace{\frac{1}{\sin^2 x + 2\cos^2 x}}_{g(x)}\, dx$$



- g spoj. na $\mathbb{R}$ $\to$ má PF na $\mathbb{R}$

  CŘ: $\underline{x \in \mathbb{R}}$

- $t = \tan x$ $\quad x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right) + k\pi$

$$\to \int \frac{1}{2+t^2}\,dt = \frac{\sqrt{2}}{2} \arctan\frac{t}{\sqrt{2}} + c_k = \overbrace{\frac{\sqrt{2}}{2}\arctan\frac{\tan x}{\sqrt{2}} + c_k}^{F_k(x)}$$

- $$\lim_{x \to \frac{\pi}{2}+k\pi^-} F_k = \lim_{x \to \frac{\pi}{2}+k\pi^-} \frac{\sqrt{2}}{2}\arctan\frac{\tan}{\sqrt{2}} + c_k = \frac{\sqrt{2}}{2}\frac{\pi}{2} + c_k$$

  "arctan ∞"

- $$\lim_{x \to \frac{\pi}{2}+k\pi^+} F_{k+1} = \lim_{x \to \frac{\pi}{2}+k\pi^+} \frac{\sqrt{2}}{2}\arctan\frac{\tan}{\sqrt{2}} + c_{k+1} = -\frac{\sqrt{2}}{2}\frac{\pi}{2} + c_{k+1}$$

$$\frac{\sqrt{2}}{2}\frac{\pi}{2} + c_k = -\frac{\sqrt{2}}{2}\frac{\pi}{2} + c_{k+1}$$

$$c_k + \sqrt{2}\frac{\pi}{2} = c_{k+1}$$

$$F(x) = \begin{cases} \frac{\sqrt{2}}{2}\arctan\frac{\tan x}{\sqrt{2}} + \cancel{c_k}\ \ c_0 + k\frac{\sqrt{2}}{2}\pi & x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right) + k\pi \\ \frac{\sqrt{2}}{4}\pi + \cancel{c_k}\ \ c_0 + k\frac{\sqrt{2}}{2}\pi & x = \frac{\pi}{2} + k\pi \end{cases}$$

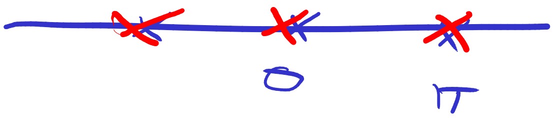
Fix c_0

$$c_k = c_0 + k \cdot \sqrt{2}\frac{\pi}{2}$$

$c_1 = c_0 + \sqrt{2}\frac{\pi}{2}$ $\qquad c_2 = c_1 + \sqrt{2}\frac{\pi}{2} = c_0 + \frac{\sqrt{2}\pi}{2} + \frac{\sqrt{2}\pi}{2}$

Varn.

$$\int \frac{\sin x}{1-\cos^2 x}\,dx$$



Spoj.: $x \in (0,\pi) + k\pi$

⋮

$$(\alpha, \beta) = (0,\pi) + k\pi$$