PP44779

MIHÁLY BENCZE - ROMANIA

Solve in $\mathbb{R}$ the equation:

$$(\tan x)^{2\cot^2 x} = (\cot x)^{2\tan^2 x}$$

Solution by Daniel Sitaru and Claudia Nănuţi.

$$(\tan x)^{2\cot^2 x} = (\cot x)^{2\tan^2 x} \Leftrightarrow (\tan x)^{\frac{2}{\tan^2 x}} = \left(\frac{1}{\tan x}\right)^{2\tan^2 x}$$

$$(\tan x)^{\frac{2}{\tan^2 x}} = (\tan x)^{-2\tan^2 x}$$

$$\frac{2}{\tan^2 x} = -2\tan^2 x \Rightarrow \tan^4 x = -1 \Rightarrow x \in \emptyset$$

□

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