

Answer on Question #44258, Math, Trigonometry

$$\tan(x) + \sec(x) - 1/\tan(x) - \sec(x) + 1 = 1 + \sin(x)/\cos(x)$$

Verify the given.

Solution:

$$\begin{aligned} \tan(x) + \sec(x) - \frac{1}{\tan x} - \sec(x) + 1 &= \tan(x) - \frac{1}{\tan x} + 1 \\ &= \frac{(\tan x)^2 - 1}{\tan x} + 1 = \frac{-1 + \frac{1}{\cos^2 x}}{\tan x} + 1 = \frac{1 - \cos^2 x}{\cos^2 x \cdot \tan x} + 1 \\ &= \frac{\sin^2 x}{\cos^2 x \cdot \tan x} + 1 = \frac{\tan^2 x}{\tan x} + 1 = \tan x + 1 = 1 + \frac{\sin x}{\cos x}. \end{aligned}$$