(14) $\sec x - \cos x = \sin x \tan x$

a) $\frac{1}{\cos} - \cos x = \sin x \tan x$

bring these 2 together ∴ get a common denominator.

$\frac{1}{\cos} - \frac{\cos^2 x}{\cos x} = \sin x \tan x$

$\frac{1-\cos^2 x}{\cos x} = \sin x \tan x$

$\frac{\sin^2 x}{\cos x} = \sin x \frac{\sin x}{\cos x}$

$\frac{\sin^2 x}{\cos x} = \frac{\sin^2 x}{\cos x}$ ✓

b) $\frac{1+\sin x}{\cos x} = \frac{\cos x}{1-\sin x}$

started by looking for a common denominator

$\frac{(1+\sin x)(1-\sin x)}{(\cos x)(1-\sin x)} = \frac{\cos x}{(1-\sin x)}$

$\frac{1-\cancel{\sin x}+\cancel{\sin x}-\sin^2 x}{(\cos x)(1-\sin x)} =$ "

$\frac{1-\sin^2 x}{(\cos x)(1-\sin x)} =$ "

$\frac{\cancel{\cos^2 x}}{\cancel{(\cos x)}(1-\sin x)} =$ "

$\frac{\cos x}{1-\sin x}$

In the end, I did not need one!

c) $\dfrac{\sin^2 x}{1-\cos x} = 1+\cos x$

$\dfrac{1-\cos^2 x}{1-\cos x} = 1+\cos x$

I see there is a difference of squares here

$\dfrac{\cancel{(1-\cos x)}(1+\cos x)}{\cancel{1-\cos x}} = 1+\cos y$

$1+\cos x = 1+\cos y$

d) $(1+\tan x)^2 + (1-\tan x)^2 = 2\sec^2 x$

$\underbrace{(1+\tan x)(1+\tan x)}_{\text{FOIL}} + \underbrace{(1-\tan x)(1-\tan x)}_{\text{FOIL}} = 2\sec^2 x$

$1 + \cancel{\tan x} + \cancel{\tan x} + \tan^2 x + 1 \cancel{- \tan x} \cancel{- \tan x} + \tan^2 x = 2\sec^2 x$

$2+2\tan^2 x = 2\sec^2 x$

$2+2\tan^2 x = 2(1+\tan^2 x)$ Pythagorea identity

$2+2\tan^2 x = 2+2\tan^2 x$