A) $\frac{\cot x - 1}{\cot x + 1} = \frac{1 - \tan x}{1 + \tan x}$

$$\frac{\frac{1}{\cot x} - 1}{\frac{1}{\cot x} + 1}$$

$$\frac{1 - \cot}{\cot} = \frac{1 - \cot}{1 + \cot} = \frac{1 - \tan x}{1 + \tan x}$$
$$1 + \frac{\cot}{\cot}$$

B) $\frac{\tan^2 x}{\sec x + 1} = \frac{1 - \cos x}{\cos x}$

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

$$\frac{\sec x - 1 \sec x + 1}{\sec x + 1}$$

$$\frac{\sec^2 x - 1}{\sec x + 1}$$

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

C) $\dfrac{1-\cos^2 x}{1+\operatorname{sen} x} = \operatorname{sen} x$

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

$1 - \dfrac{1-\operatorname{sen} x}{1+\operatorname{sen} x}$

$\dfrac{1+\operatorname{sen} x - 1 + \operatorname{sen} x}{1+\operatorname{sen} x}$

$= 1 - 1 - \operatorname{sen} x$

$= 1 - 1 + \operatorname{sen} x$

$= \operatorname{sen} x = \operatorname{sen} x$

D)

$\dfrac{\operatorname{Tan} x - \operatorname{sen} x}{\operatorname{sen}^3 x} = \dfrac{\sec x}{1+\cos x}$

$\dfrac{\dfrac{\operatorname{sen} x}{\cos x} - \operatorname{sen} x}{\operatorname{sen}^3 x}$

$\dfrac{\operatorname{sen} x - \cos x \operatorname{sen} x}{\dfrac{\cos x}{\operatorname{sen}^3 x}}$

$\dfrac{\operatorname{sen} x - \cos x \operatorname{sen} x}{\cos x} \cdot \dfrac{\operatorname{sen}^3 x}{1}$

$$\frac{\operatorname{sen} x \cdot \cos x \cdot \operatorname{sen} x}{\cos x \ \operatorname{sen}^3 x}$$

$$\frac{\operatorname{sen} x \ (1-\cos x)}{\cos x \cdot \operatorname{sen}^3 x}$$

$$\frac{1-\cos x}{\cos x \cdot \operatorname{sen}^2 x}$$

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

$$\frac{1}{\cos^2 x \ (1+\cos x)}$$

$$\frac{\sec x}{1+\cos x} = \frac{\sec x}{1+\cos x}$$

E) $\dfrac{1}{1+\operatorname{sen} x} + \dfrac{1}{1-\operatorname{sen} x} = 2\sec^2 x$

$$\frac{1}{1+\operatorname{sen} x} + \frac{1}{1-\operatorname{sen} x} =$$

$$\frac{1+\operatorname{sen} x + 1-\operatorname{sen} x}{1+\operatorname{sen} x \ 1-\operatorname{sen} x}$$

$$\frac{1+\operatorname{sen} x + 1-\operatorname{sen} x}{1-\operatorname{sen}^2 x} = \frac{2}{\cos^2 x} = 2\sec^2 x \equiv 2\sec^2 x$$

F. $\frac{\cos x}{1-\tan x} + \frac{\sen x}{1-\cot x} = \sen x + \cos x$

$$\frac{\cos x}{1-\frac{\sen x}{\cos x}} + \frac{\sen x}{1-\frac{\cos x}{\sen x}} =$$

$$\frac{\cos^2 x}{\cos x - \sen x} + \frac{\sen^2 x}{\sen x - \cos x}$$

$$\frac{\cos^2 x - \sen^2 x}{\cos x - \sen x}$$

$$= \frac{\cos x + \sen x + \cos x - \sen x}{\cos x - \sen x}$$

$$= \cos x + \sen x$$

$$= \sen x + \cos x = \sen x + \cos x$$

5 $\frac{\sen^2 x - \tan x}{\cos^2 x - \cot x} = \tan^2 x$

$$\frac{\sen^2 x - \frac{\sen x}{\cos x}}{\cos^2 x - \frac{\cos x}{\sen x}} =$$

$$\frac{\cos x \sen^2 x - \sen x \cdot \sen x}{\cos^2 x \sen x - \cos x \cdot \cos x} =$$

$$\frac{\cos x \operatorname{sen}^3 x - \operatorname{sen}^2 x}{\cos^3 x \operatorname{sen} x - \cos^2 x}$$

$$\frac{[\operatorname{sen}^2 x\,[\operatorname{sen} x \cos x - 1]]}{[\cos^2 x\,[\cos x \operatorname{sen} x - 1]]}$$

$$\frac{\operatorname{sen}^2 x}{\cos^2 x} = \tan^2 x$$

H. $$\frac{1-\operatorname{sen} x}{1+\operatorname{sen} x} = [\sec x - \tan x]^2$$

$$\frac{1-\operatorname{sen} x^2}{1-\operatorname{sen}^2} =$$

$$\frac{1 - 2\operatorname{sen} x \operatorname{sen}^2 x}{\cos^2 x}$$

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

$$\sec x - \tan x^2 = [\sec x - \tan x]^2$$