Accelerated Precalculus Name: _____

4.06 HW Simplifying Trigonometric Expressions

Simplify each trigonometric expression. Match the result to an expression in the list to the right.

1. $\frac{\sin x}{1-\cos x} + \cot(-x)$ → $-\cot x$

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

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

$\frac{\sin^2 x - \cos x + \cos^2 x}{(1-\cos x)\sin x} \rightarrow \frac{(1-\cos x)}{(1-\cos x)\sin x} = \frac{1}{\sin x} = \csc x$ C

2. $\csc\left(\frac{\pi}{2} - x\right) - \cos(-x) - \sin(-x)\tan(-x)$

$\sec x - \cos x - \sin x \tan x$

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

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

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

$\frac{1-1}{\cos x} = \frac{0}{\cos x} = 0$ E

Simplified expressions:
✓ A. $2\tan x$
✓ B. $\cos^2 x$
✓ C. $\csc x$
✓ D. $\tan^4 x + \tan^2 x$
E. 0
✓ F. $\sec x$

3. $-\cot\left(x - \frac{\pi}{2}\right) + \frac{\cos x}{1+\sin x}$

$+\frac{\tan x}{1} + \frac{\cos x}{1+\sin x}$

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

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

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

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

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

4. $\frac{\cos^2(-x) - \sin^2(-x)}{1-\tan^2 x}$

$\frac{\cos^2 x - (-\sin x)^2}{1-\tan^2 x} \rightarrow \frac{\cos^2 x - \sin^2 x}{\frac{\cos^2 x}{\cos^2 x} - \frac{\sin^2 x}{\cos^2 x}}$

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

$(\cos^2 x - \sin^2 x) \cdot \frac{\cos^2 x}{\cos^2 x - \sin^2 x}$

$\cdot \cos^2 x$ B

5. $\frac{\sec x}{\csc x} + \frac{\cos\left(\frac{\pi}{2} - x\right)}{\sin\left(\frac{\pi}{2} - x\right)}$

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

$\frac{1}{\cos x} \cdot \frac{\sin x}{1} + \frac{\sin x}{\cos x}$

$\frac{2\sin x}{\cos x} = 2\tan x$ A

6. $\sec^4 x - \sec^2 x$

$\sec^2 x(\sec^2 x - 1)$

* $1 + \tan^2 x = \sec^2 x$

$\tan^2 x = \sec^2 x - 1$

$\sec^2 x(\tan^2 x)$

$\frac{1}{\cos^2 x} \cdot \frac{\sin^2 x}{\cos^2 x} = \frac{\sin^2 x}{\cos^4 x}$

$(1+\tan^2 x)(\tan^2 x) = \tan^2 x + \tan^4 x$ D