Name: _____

Verifying Trigonometric Identities

Exercise 1: Verify each identity.

1) $\sin t \csc t = 1$

2) $\sec y \cos y = 1$

3) $(1 - \sin a)(1 + \sin a) = \cos^2 a$

4) $\cot^2 y (\sec^2 y - 1) = 1$

5) $\cos^2 x - \sin^2 x = 1 - 2\sin^2 x$

6) $\cos^2 x - \sin^2 x = 2\cos^2 x - 1$

7) $\sin^2 x - \sin^4 x = \cos^2 x - \cos^4 x$

8) $\cos x + \sin x \tan x = \sec x$

9) $\dfrac{\csc^2 \theta}{\cot \theta} = \csc \theta \sec \theta$

10) $\dfrac{\cot^3 t}{\csc t} = \cos t (\csc^2 t - 1)$

11) $\dfrac{1}{\tan \beta} + \tan \beta = \dfrac{\sec^2 \beta}{\tan \beta}$

12) $\sec^6 x (\sec x \tan x) - \sec^4 x (\sec x \tan x) = \sec^5 x \tan^3 x$

13) $\dfrac{1}{\sec x \tan x} = \csc x - \sin x$

14) $\csc x - \sin x = \cos x \cot x$

15) $\sec x - \cos x = \sin x \tan x$

16) $\dfrac{\cos x \cot x}{1 - \sin x} - 1 = \csc x$

17) $\dfrac{1 + \sin \theta}{\cos \theta} + \dfrac{\cos \theta}{1 + \sin \theta} = 2\sec \theta$

18) $\dfrac{1}{\sin x + 1} + \dfrac{1}{\cos x + 1} = 1$

19) $\cos x - \dfrac{\cos x}{1 - \tan x} = \dfrac{\sin x \cos x}{\sin x - \cos x}$

20) $\dfrac{\csc(-x)}{\sec(-x)} = -\cot x$

21) $\dfrac{\tan \phi \cot \phi}{\cos \phi} = \sec \phi$

22) $\dfrac{\tan \theta + \cot \phi}{\tan \theta \cot \phi} = \tan \phi + \cot \theta$

23) $\dfrac{\tan \theta + \tan \phi}{1 - \tan \theta \tan \phi} = \dfrac{\cot \theta + \cot \phi}{\cot \theta \cot \phi - 1}$

Exercise 2: Verify each identity

1) $\tan^5 x = \tan^3 x \sec^2 x - \tan^3 x$

2) $\sec^4 x \tan^2 x = \sec^2 x (\tan^2 x + \tan^4 x)$

3) $\cos^3 x \sin^2 x = (\sin^2 x - \sin^4 x)\cos x$

4) $\sin^4 x + \cos^4 x = 1 - 2\cos^2 x + 2\cos^4 x$

Grade 11