Name_____ Date_____ Period_____

Worksheet 6.2—Trig Proofs

Show all work. No Calculator, or course (unless you use the side of it as a straight-edge to draw your line down the equal sign.)

I. Multiple Choice
NONE

II. Proofs

Prove the following identities. Show all steps working down vertically. Each line must be an equivalent statement to the one above it.

1. $1+\dfrac{\cot A}{\csc A}-\sin^2 A=\cos A(\cos A+1)$

2. $\tan B+\cot B=\csc B\sec B$

3. $\dfrac{\cot\varphi}{\sec\varphi}=\csc\varphi-\sin\varphi$

4. $\dfrac{\sec\beta}{1+\cos\beta}=\csc^2\beta(\sec\beta-1)$

5. $(\tan\alpha-\sec\alpha)^2=\dfrac{1-\sin\alpha}{1+\sin\alpha}$

6. $\sin^4\psi-\cos^4\psi=1-2\cos^2\psi$

7. $\sec^4\delta-2\sec^2\delta\tan^2\delta+\tan^4\delta=1$

8. $\sqrt[3]{\tan^2 x-\sec^2 x}=-1$

9. $\dfrac{1}{\csc y+\cot y}=\dfrac{1-\cos y}{\sin y}$

10. $(\sec x+\tan x)^3(\sec x-\tan x)^4=\dfrac{1-\sin x}{\cos x}$

11. $\dfrac{\sin\kappa-1}{\cos\kappa}=\tan\kappa-\sec\kappa$

12. $\dfrac{\sec\omega}{\sin\omega}-\dfrac{\sin\omega}{\cos\omega}=\cot\omega$

13. $\dfrac{\sec x}{1+\cos x} = \csc^2 x\left(\sec x - 1\right)$

14. $\tan x - 1 = \dfrac{\sec x - \csc x}{\csc x}$

15. $\csc x\left(\sin x + \cos x\right) = \cot x + 1$

16. $\dfrac{\sin y + \tan y}{1+\sec y} = \sin y$

17. $\tan^2 x \sin^2 x = \tan^2 x - \sin^2 x$

18. $\dfrac{\cos x + 1}{\sin^3 x} = \dfrac{\csc x}{1 - \cos x}$

19. $\dfrac{\tan \Delta}{\sec \Delta} + \dfrac{\cot \Delta}{\csc \Delta} = \sin \Delta + \cos \Delta$

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

21. $(\sin x+\cos x)^2 \tan x = \tan x + 2\sin^2 x$

22. $\dfrac{\csc^2 \wp - 1}{\csc \wp + 1} = \dfrac{1}{\sin \wp} - 1$

23. $\dfrac{\sec^2 x - 6\tan x + 7}{\sec^2 x - 5} = \dfrac{\tan x - 4}{\tan x + 2}$