**GSE PreCalculus Uni 5: Trig Identities** **Name** _____
**Worksheet 5.2** **Date** _____ **Day** _____

Verify the identity algebraically

1. $\csc\theta\tan\theta = \sec\theta$

2. $\cos\theta\sec\theta - \cos^2\theta = \sin^2\theta$

3. $\dfrac{\csc\theta}{\sec\theta} + \dfrac{\cos\theta}{\sin\theta} = 2\cot\theta$

Hint: simplify $\dfrac{\csc\theta}{\sec\theta}$ in terms of $\sin\theta, \cos\theta$

4. $\dfrac{\sec^2\theta - \tan^2\theta + \tan\theta}{\sec\theta} = \cos\theta + \sin\theta$ Very Challenging!!!

5. $\sin t\csc t = 1$

6. $\tan y\cot y = 1$

7. $\dfrac{\csc^2 x}{\cot x} = \csc x\sec x$

8. $\cot^2 y(\sec^2 y - 1) = 1$ Hint: rewrite $\sec^2 y - 1$

9. $\cos^2\beta - \sin^2\beta = 2\cos^2\beta - 1$

10. $\tan^2\theta + 6 = \sec^2\theta + 5$

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11. $2-\csc^2 z = 1-\cot^2 z$

Hint: rewrite $\csc^2 z$ as $1+\cot^2 z$

12. $\cos x + \sin x \tan x = \sec x$

13. $\dfrac{\csc\theta}{\sin\theta} - \dfrac{\cot\theta}{\tan\theta} = 1$

14. $\sec^4\theta - \tan^4\theta = 1 + 2\tan^2\theta$

Hint: factor as a difference of two squares
$x^4 - y^4 = (x^2 - y^2)(x^2 + y^2)$

15. $\csc^4\theta - \cot^4\theta = 2\csc^2\theta - 1$

Hint: factor as a difference of two squares
$x^4 - y^4 = (x^2 - y^2)(x^2 + y^2)$

16. $\dfrac{1}{1+\cos\theta} + \dfrac{1}{1-\cos\theta} = 2\csc^2\theta$