Name: _____                                Date _____
Mr. Schlansky                                              Algebra II

# *Pythagorean Identities*

1. Simplify:    $\sec^2 \vartheta (1 - \cos^2 \vartheta)$

2. Simplify:    $\sec \vartheta (1 - \sin^2 \vartheta)$

3. Simplify:    $\tan^2 \vartheta + \sin^2 \vartheta + \cos^2 \vartheta$

4. Show that $\dfrac{\sec^2 x - 1}{\sec^2 x}$ is equivalent to $\sin^2 x$.

5. The expression $\dfrac{\sin^2\theta + \cos^2\theta}{1 - \sin^2\theta}$ is equivalent to

1) $\cos^2\theta$
2) $\sin^2\theta$
3) $\sec^2\theta$
4) $\csc^2\theta$

6. The expression $\sin A + \dfrac{\cos^2 A}{\sin A}$ is equivalent to

(1) 1
(2) $\sin A$
(3) $\sec A$
(4) $\csc A$

7. The expression $(\cos^2\vartheta - 1)$ is equivalent to

(1) $\sin^2\vartheta$
(2) $\cos^2\vartheta$
(3) $-\sin^2\vartheta$
(4) $-\cos^2\vartheta$

8. Which trigonometric expression does *not* simplify to 1?

1) $\sin^2 x(1 + \cot^2 x)$
2) $\sec^2 x(1 - \sin^2 x)$
3) $\cos^2 x(\tan^2 x - 1)$
4) $\cot^2 x(\sec^2 x - 1)$