A. -1	**B.** $\sec\theta$	**C.** 1	**D.** $\sin^2\theta$
E. 2	**F.** $\cos^2\theta$	**G.** $\sec\theta\csc\theta$	**H.** $\cos\theta$

Directions: Simplify the following expressions and match your answer with one of the answers in the box above. Each answer should be used exactly once. Be sure to show all appropriate work that leads to your answer.

1. $\tan^2\theta - \sec^2\theta$
$= \tan^2\theta - (1 + \tan^2\theta) = -1$
A

2. $\tan\theta\sin\theta + \cos\theta$
$= \frac{\sin\theta}{\cos\theta}\cdot\sin\theta + \cos\theta$
$= \frac{\sin^2\theta + \cos^2\theta}{\cos\theta} = \frac{1}{\cos\theta}$
$= \sec\theta$
B

3. $\frac{\tan^2\theta}{1 + \tan^2\theta}$
$= \frac{\tan^2\theta}{\sec^2\theta} = \left(\frac{\tan\theta}{\sec\theta}\right)^2$
$= \left(\frac{\sin\theta}{\cos\theta} \div \frac{1}{\cos\theta}\right)^2 = \sin^2\theta$
D

4. $\tan\theta + \cot\theta$
$= \tan\theta + \frac{1}{\tan\theta} = \frac{\tan^2\theta + 1}{\tan\theta}$
$= \frac{\sec^2\theta}{\tan\theta} = \left(\frac{1}{\cos^2\theta}\right)\left(\frac{\cos\theta}{\sin\theta}\right)$
$= \left(\frac{1}{\cos\theta}\right)\left(\frac{1}{\sin\theta}\right) = \sec\theta\csc\theta$
G

5. $\sec\theta - \tan\theta\sin\theta$
$= \frac{1}{\cos\theta} - \frac{\sin^2\theta}{\cos\theta} = \frac{1 - \sin^2\theta}{\cos\theta}$
$= \frac{\cos^2\theta}{\cos\theta} = \cos\theta$
H

6. $\frac{(\csc^2\theta - 1)}{\csc^2\theta}$
$= 1 - \frac{1}{\csc^2\theta} = 1 - \sin^2\theta$
$= \cos^2\theta$
F

7. $\frac{\csc\theta}{\sin\theta} - \frac{\cot\theta}{\tan\theta}$
$= (\csc\theta)\left(\frac{1}{\sin\theta}\right) - \left((\cot\theta)\left(\frac{1}{\tan\theta}\right)\right)$
$= (\csc\theta)(\csc\theta) - (\cot\theta)(\cot\theta) = \csc^2\theta - \cot^2\theta$
$= 1 + \cot^2\theta - \cot^2\theta = 1$
C

8. $(\sin\theta - \cos\theta)^2 + (\sin\theta + \cos\theta)^2$
$= (\sin^2\theta - 2\sin\theta\cos\theta + \cos^2\theta)$
$+ (\sin^2\theta + 2\sin\theta\cos\theta + \cos^2\theta)$
$= 2\sin^2\theta + 2\cos^2\theta = 2(\sin^2\theta + \cos^2\theta) = 2(1)$
$= 2$
E