Name Mine Date

Practice 8.1b: Fundamental Trig Identities

1. Use the Fundamental Trig Identities to simplify the following expressions.

a. $\frac{\sin(-\alpha)}{\cos\alpha} = \frac{-\sin\alpha}{\cos\alpha} = -\tan\alpha$

b. $\frac{\tan^2\theta}{\sec^2\theta}$

c. $\cos(90°-x)\sec x$

d. $\cot(\frac{\pi}{2}-\sigma)\cos\sigma$

$= \tan\sigma \cdot \cos\sigma$

$= \frac{\sin\sigma}{\cos\sigma} \cdot \cos\sigma = \sin\sigma$

e. $\frac{\cos^2\mu}{1-\sin\mu} = \frac{1-\sin^2\mu}{1-\sin\mu}$

$1+\sin\mu = \frac{(1+\sin\mu)(1-\sin\mu)}{1-\sin\mu}$

f. $\cos t\,(1+\tan^2 t)$

2. **Factor the expression** and then use the Fun. Trig Identities to simplify the expressions.

a. $\tan^2 x - \tan^2 x \sin^2 x$

b. $\sec^2 y \tan^2 y + \sec^2 y = \sec^2 y(\tan^2 y + 1)$

$= \sec^2 y \cdot \sec^2 y$

$= \sec^4 y$

c. $\frac{\sec^2\alpha - 1}{\sec\alpha - 1} = \frac{(\sec\alpha+1)(\sec\alpha-1)}{\sec\alpha-1}$

$= \sec\alpha + 1$

d. $\frac{\csc^2\gamma - 1}{\csc\gamma + 1}$

e. $\tan^4 x + 2\tan^2 x + 1$ like: $x^2+2x+1 = (x+1)(x+1)$

$(\tan^2 x+1)(\tan^2 x+1)$

$\sec^2 x \cdot \sec^2 x$

$\sec^4 x$

f. $\sin^4 z - \cos^4 z$ like: $x^2-y^2 = (x+y)(x-y)$