Lesson 5.5 Extra Practice

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1. State whether or not the equation is an identity.

a) $\tan\theta = \dfrac{\cos\theta}{\sin\theta}$

b) $\csc^2\theta = 1 + \cot^2\theta$

c) $\dfrac{\cos\theta}{\sin\theta} = \cot\theta$

d) $1 + \sec^2\theta = \tan^2\theta$

2. Simplify each expression.

a) $(\tan\phi + 4)(\tan\phi - 4)$

b) $(3 + \cos\phi)(3 - \cos\phi)$

3. Simplify each expression; state any restrictions.

a) $\dfrac{\sin x}{\cos x}$

b) $\sin x \times \dfrac{\cos x}{\tan x}$

c) $1 + \tan^2 x$

d) $\tan^2 x \times \cos^2 x$

4. Factor each expression.

a) $\tan^2\alpha - 25$

b) $16 - \sin^2\alpha$

c) $\sin^2\alpha + 2\sin\alpha + 1$

d) $\cos^2\alpha - 6\cos\alpha + 9$

e) $\sin^2\alpha + 2 \times \sin\alpha \times \cos\alpha + \cos^2\alpha$

f) $4 + 2\sin\alpha$

5. Simplify each expression.

a) $\sec\theta \times \cot\theta$

b) $\left(\dfrac{1}{\sec\theta} + \dfrac{1}{\csc\theta}\right)^2$

c) $\dfrac{\sin\theta \times \cos\theta}{\sec\theta \times \csc\theta}$

d) $\tan^2\theta + 1$

e) $\cos^2\theta \times \sec^2\theta + \tan^2\theta$

f) $\dfrac{\cos^2\theta + \sin^2\theta}{\csc^2\theta + \sec^2\theta}$

6. Factor the following expression: $\dfrac{1 - \sin^2\beta}{\cos^2\beta}$

7. State whether or not the equation is an identity.

a) $\sin\theta \times \csc\theta = 1$

b) $\csc^2\theta + \sec^2\theta = 1$

c) $\dfrac{\sin^2\theta + \cos^2\theta}{1 + \tan^2\theta} = \cos\theta$

d) $\sin\theta + \cos\theta = \dfrac{1}{2}$

e) $\dfrac{1}{1 + \cot^2\theta} = \sin^2\theta$

f) $\dfrac{\cos^2\theta}{\sin^2\theta} = \sec^2\theta - 1$