Trigonometry
Chapter 7
Sections 1 & 2 RETAKE

Best Wishes to _____ Key _____

1. If $\sin \theta = \frac{4}{5}$, find $\csc \theta$, if $0 < \theta < \frac{\pi}{2}$.

$$\csc \theta = \frac{5}{4}$$

2. If $\sec \theta = \frac{7}{2}$, find $\tan \theta$ if $\frac{\pi}{2} < \theta < \pi$.

$$\cos \theta = \frac{2}{7} \qquad \sin \theta = \frac{\sqrt{45}}{7}$$

$$\sin^2 \theta = 1 - \left(\frac{2}{7}\right)^2 \qquad \tan \theta = \frac{\sqrt{45}/7}{2/7}$$

$$\sin^2 \theta = \frac{45}{49}$$

$$\frac{\sqrt{45}}{7} \cdot \frac{7}{2} = \ominus \frac{\sqrt{45}}{2}$$
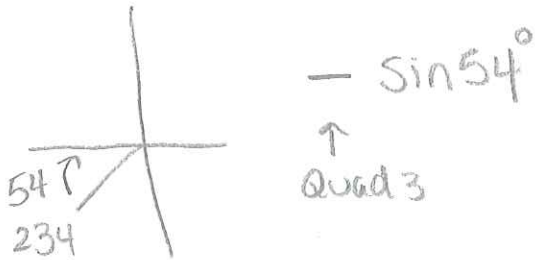
Express each value as a trigonometric function of an angle in Quadrant I.

3. $\sin 594° = \sin 234$

$$-\sin 54°$$

$$\uparrow$$
Quad 3

54
234

4. $\cot \frac{32\pi}{5} \cdot \frac{180}{\pi} = 1152$

$$\cot 72$$

Quad 3

Simplify each expression.

5. $(\sin x)(\tan x)(\sec x)$

$$\frac{\sin x}{1} \cdot \frac{\sin x}{\cos x} \cdot \frac{1}{\cos x}$$

$$\frac{\sin^2 x}{\cos^2 x} = \tan^2 x$$

6. $\dfrac{1 - \sin^2 A}{1 + \tan^2 A}$

$$= \frac{\cos^2 A}{\sec^2 A} = \frac{\cos^2 A}{\frac{1}{\cos^2 A}}$$

$$= \cos^2 A \cdot \cos^2 A = \cos^4 A$$

7. $\cos^2 x \tan^2 x + \cos^2 x$ GCF!

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

$$\cos^2 x (\sec^2 x)$$

$$\frac{\cos^2 x}{1} \cdot \frac{1}{\cos^2 x} = 1$$

Find a numerical value of one trigonometric function of x.

8. $\dfrac{\tan x}{\sec x} = 5$

$\dfrac{\frac{\sin x}{\cos x}}{\frac{1}{\cos x}} = 5$

$\dfrac{\sin x}{\cos x} \cdot \dfrac{\cos x}{1} = 5$

$\boxed{\sin x = 5}$

9. $(1 + \cos\theta)(\csc\theta - \cot\theta) = 2$

$\csc\theta - \cot\theta + \cos\theta\csc\theta - \cos\theta\cot\theta = 2$

$\dfrac{1}{\sin\theta} - \dfrac{\cos\theta}{\sin\theta} + \dfrac{\cos\theta}{\sin\theta} - \cos\theta \cdot \dfrac{\cos\theta}{\sin\theta} = 2$

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

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

$\dfrac{\sin^2\theta}{\sin\theta} = 2$

$\boxed{\sin\theta = 2}$

10. $\cot x + \sin x = -\cos x \cot x$

$\dfrac{\cos x}{\sin x} + \sin x = -\cos x \cdot \dfrac{\cos x}{\sin x}$

$\sin x \cdot \dfrac{\cos x}{\sin x} + \dfrac{\sin^2 x}{\sin x} = -\dfrac{\cos^2 x}{\sin x} \cdot \sin x$

$\cos x + \sin^2 x = -\cos^2 x$

$\cos x + \sin^2 x + \cos^2 x = 0$

$\longrightarrow \cos x + 1 = 0 \longrightarrow \boxed{\cos x = -1}$

Verify that each equation is an identity.

11. $\dfrac{\sec\theta - \csc\theta}{\csc\theta\sec\theta} = \sin\theta - \cos\theta$

$\dfrac{\frac{1}{\cos\theta} - \frac{1}{\sin\theta}}{\frac{1}{\sin\theta} \cdot \frac{1}{\cos\theta}} = \sin\theta - \cos\theta$

$\left(\dfrac{1}{\cos\theta} - \dfrac{1}{\sin\theta}\right)\sin\theta\cos\theta = \sin\theta - \cos\theta$

$\sin\theta - \cos\theta = \sin\theta - \cos\theta$

12. $\dfrac{1 + \tan^2\theta}{\tan^2\theta} = \csc^2\theta$

$\dfrac{\sec^2\theta}{\tan^2\theta} = \csc^2\theta$

$\dfrac{1}{\cos^2\theta} \cdot \dfrac{\cos^2\theta}{\sin^2\theta} = \csc^2\theta$

$\dfrac{1}{\sin^2\theta} = \csc^2\theta$

$\csc^2\theta = \csc^2\theta$

13. $2\sin A + (1 - \sin A)^2 = 2 - \cos^2 A$

$2\sin A + 1 - 2\sin A + \sin^2 A = 2 - \cos^2 A$

$1 + \sin^2 A = 1 + 1 - \cos^2 A$

$1 + \sin^2 A = 1 + \sin^2 A$

14. $\dfrac{1 + \tan x}{\sin x + \cos x} = \sec x$

$\dfrac{(1 + \tan x)}{\sin x + \cos x} \cdot \dfrac{(\sin x - \cos x)}{\sin x - \cos x} = \sec x$

$\dfrac{\sin x + \frac{\sin^2 x}{\cos x} - \cos x - \cos x \cdot \frac{\sin x}{\cos x}}{\sin^2 x - \cos^2 x} = \sec x$

$\dfrac{\sin^2 x - \cos^2 x}{\cos x} \cdot \dfrac{1}{\sin^2 x - \cos^2 x} = \sec x$

$\dfrac{1}{\cos x} = \sec x$

$\sec x = \sec x$