7-1 and 7-2 Review Name Answer Key

1. If $\sin\theta = \frac{1}{2}$, and $0° < \theta < 90°$ find $\csc\theta$.

$\csc\theta = 2$

2. If $\tan\theta = 4$, and $180° < \theta < 270°$ find $\sec\theta$.

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

$1+(4)^2 = \sec^2\theta$

$\boxed{-\sqrt{17} = \sec\theta}$

3. If $\csc\theta = \frac{5}{3}$, and $\frac{\pi}{2} < \theta < \pi$ find $\cos\theta$.

$\sin^2\theta + \cos^2\theta = 1$

$\left(\frac{3}{5}\right)^2 + \cos^2\theta = 1$

$\frac{9}{25} + \cos^2\theta = \frac{25}{25}$

$\boxed{\cos\theta = \frac{-4}{5}}$

4. If $\cos\theta = \frac{4}{5}$, and $\frac{3\pi}{2} < \theta < 2\pi$ find $\tan\theta$.

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

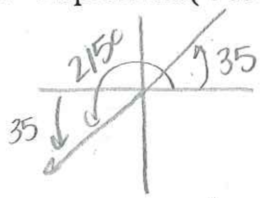
$1+\tan^2\theta = \left(\frac{5}{4}\right)^2$

$1+\tan^2\theta = \frac{25}{16}$

$\tan^2\theta = \frac{9}{16}$

$\boxed{\tan\theta = \frac{-3}{4}}$

5. Express csc(-505°) as a trigonometric function of an angle in Quadrant I.



$\boxed{-\csc 35°}$

6. Express $\cos\frac{7\pi}{3}$ as a trigonometric function of an angle in Quadrant I.

$\frac{7\pi}{3} - \frac{6\pi}{3} = \frac{\pi}{3}$

$\boxed{\cos\frac{\pi}{3}}$

Simplify each expression.

7. $\cot^2 x \sec^2 x$

$\frac{\cancel{\cos^2 x}}{\sin^2 x} \cdot \frac{1}{\cancel{\cos^2 x}}$

$\frac{1}{\sin^2 x} = \boxed{\csc^2 x}$

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

$\dfrac{\frac{1}{\cancel{\sin\theta}} \cdot \frac{\cancel{\sin\theta}}{\cos\theta}}{\sec^2\theta} = \dfrac{\frac{1}{\cos\theta}}{\sec^2\theta}$

$= \frac{\sec\theta}{\sec^2\theta} = \frac{1}{\sec\theta} = \boxed{\cos\theta}$

9. $\dfrac{\sin^2\alpha+\cos^2\alpha}{\tan^2\alpha+1} = \dfrac{1}{\sec^2\theta}$

$= \boxed{\cos^2\theta}$

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

$\dfrac{\cos x}{1}\dfrac{\cos x}{\sin x} + \sin x \cdot \dfrac{\sin x}{\sin x}$

$\dfrac{\cos^2 x}{\sin x} + \dfrac{\sin^2 x}{\sin x} = \dfrac{1}{\sin x} \quad \boxed{\csc x}$

11. $\dfrac{\tan x + \cos x + \sin x \tan x}{\sec x + \tan x}$

$\dfrac{\dfrac{\sin x}{\cos x} + \cos x \cdot \dfrac{\cos x}{\cos x} + \sin x \cdot \dfrac{\sin x}{\cos x}}{\dfrac{1}{\cos x} + \dfrac{\sin x}{\cos x}}$

$\dfrac{\dfrac{\sin x + \cos^2 x + \sin^2 x}{\cos x}}{\dfrac{1+\sin x}{\cos x}}$

$\dfrac{\cancel{\dfrac{\sin x + 1}{\cos x}}}{\cancel{\dfrac{1+\sin x}{\cos x}}}$

$\boxed{1}$

12. $\sec^2\theta - \tan^2\theta \longrightarrow (1+\cancel{\tan^2\theta}) - \cancel{\tan^2\theta}$

$\boxed{1}$

Verify each identity.

13. $\sec^2 x = \dfrac{1-\cos^2 x}{1-\sin^2 x} + \csc^2 x - \cot^2 x$

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

$= \tan^2 x + \csc^2 x - \cot^2 x$

$= \tan^2 x + (1+\cancel{\cot^2 x}) - \cancel{\cot^2 x}$

$= \tan^2 x + 1 \quad \boxed{\sec^2 x = \sec^2 x}$

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

$\dfrac{\tan\beta(1+\sin\beta) + \cos\beta}{1+\sin\beta}$

$\dfrac{\tan\beta + \tan\beta\sin\beta + \cos\beta}{1+\sin\beta}$

$\dfrac{\dfrac{\sin\beta}{\cos\beta} + \dfrac{\sin\beta}{\cos\beta}\sin\beta + \cos\beta}{1+\sin\beta}$

$\dfrac{\dfrac{\sin\beta + \sin^2\beta + \cos^2\beta}{\cos\beta}}{1+\sin\beta}$

$\dfrac{\cancel{\dfrac{\sin\beta+1}{\cos\beta}}}{\cancel{1+\sin\beta}}$

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

$\boxed{\sec\beta = \sec\beta}$

15. $\dfrac{\csc x}{\cot x + \tan x} = \cos x$

$\dfrac{\dfrac{1}{\sin x}}{\dfrac{\cos x}{\sin x} + \dfrac{\sin x}{\cos x}} = \dfrac{\dfrac{1}{\sin x}}{\dfrac{\cos^2 x + \sin^2 x}{\sin x \cos x}} = \dfrac{\dfrac{1}{\sin x}}{\dfrac{1}{\sin x \cos x}}$

$\dfrac{1}{\cancel{\sin x}} \cdot \dfrac{\cancel{\sin x}\cos x}{1}$

$\boxed{\cos x = \cos x}$

16. $\dfrac{1}{\sin y - 1} - \dfrac{1}{\sin y + 1} = -2\sec^2 y$

$\dfrac{\cancel{\sin y} + 1 - (\cancel{\sin y} - 1)}{(\sin y - 1)(\sin y + 1)}$

$\dfrac{2}{\sin^2 y - 1}$

$= \dfrac{2}{-\cos^2 y}$

$= \boxed{-2\sec^2 y = -2\sec^2 y}$

Find a numerical value of one trigonometric function of *x*.

17. $\sin x \cot x = 1$

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

$\boxed{\cos x = 1}$

18. $\sin^2 x \sec x \cot x = 3$

$\sin^2 x \cdot \dfrac{1}{\cancel{\cos x}} \cdot \dfrac{\cancel{\cos x}}{\cancel{\sin x}} = 3$

$\boxed{\sin x = 3}$