5.1 HW Answers

Monday, November 20, 2017 12:00 PM

1. $\sin x \sec x = \sin x \cdot \frac{1}{\cos x}$

$= \frac{\sin x}{\cos x}$

$= \tan x$

2. $2\cos x \csc x = \cos x \cdot \frac{1}{\sin x}$

$= \frac{\cos x}{\sin x}$

$= \cot x$

3. $\tan(-x) \cdot \cos x = -\tan x \cdot \cos x$

$= -\frac{\sin x}{\cancel{\cos x}} \cdot \cancel{\cos x}$

$= -\sin x$

4. $\cot(-x)\sin x = -\cot x \sin x$

$= -\frac{\cos x}{\cancel{\sin x}} \cdot \cancel{\sin x}$

$= -\cos x$

5. $\tan x \csc x \cos x = \frac{\cancel{\sin x}}{\cancel{\cos x}} \cdot \frac{1}{\cancel{\sin x}} \cancel{\cos x}$

$= 1$

6. $\cot x \sec x \sin x = \frac{\cancel{\cos x}}{\cancel{\sin x}} \cdot \frac{1}{\cancel{\cos x}} \cdot \cancel{\sin x}$

$= 1$

7. $\sec x - \sec x \sin^2 x = \sec x(1 - \sin^2 x)$

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

$= \cos x$

8. $\csc x - \csc x \cos^2 x = \csc x(1 - \cos^2 x)$

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

$= \sin x$

9. $\cos^2 x - \sin^2 x = (1 - \sin^2 x) - \sin^2 x$

$= 1 - \sin^2 x - \sin^2 x$

$= 1 - 2\sin^2 x$

10. $\cos^2 x - \sin^2 x = \cos^2 x - (1 - \cos^2 x)$

$= \cos^2 x - 1 + \cos^2 x$

$= 2\cos^2 x - 1$

11. $\csc\theta - \sin\theta = \frac{1}{\sin\theta} - \sin\theta$

$= \frac{1}{\sin\theta} - \frac{\sin^2\theta}{\sin\theta}$

$= \frac{1 - \sin^2\theta}{\sin\theta}$

$= \frac{\cos^2\theta}{\sin\theta}$

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

$= \cot\theta\cos\theta$

12. $\tan\theta + \cot\theta = \frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}$

$= \frac{\sin\theta}{\cos\theta} \cdot \frac{\sin\theta}{\sin\theta} + \frac{\cos\theta}{\sin\theta} \cdot \frac{\cos\theta}{\cos\theta}$

$= \frac{\sin^2\theta}{\cos\theta\sin\theta} + \frac{\cos^2\theta}{\cos\theta\sin\theta}$

$= \frac{\sin^2\theta + \cos^2\theta}{\cos\theta\sin\theta}$

$= \frac{1}{\cos\theta\sin\theta}$

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

$= \sec\theta\csc\theta$

13. $\frac{\tan\theta\cot\theta}{\csc\theta} = \frac{\frac{\cancel{\sin\theta}}{\cancel{\cos\theta}} \cdot \frac{\cancel{\cos\theta}}{\cancel{\sin\theta}}}{\frac{1}{\ }}$

$= \cot\theta\cos\theta$

13. $$\frac{\tan\theta\cot\theta}{\csc\theta} = \frac{\frac{\sin\theta}{\cancel{\cos\theta}}\cdot\frac{\cos\theta}{\cancel{\sin\theta}}}{\frac{1}{\sin\theta}}$$

$$= \frac{1}{\frac{1}{\sin\theta}}$$

$$= 1 \div \frac{1}{\sin\theta}$$

$$= 1 \cdot \frac{\sin\theta}{1}$$

$$= \sin\theta$$

14. $$\frac{\cos\theta\sec\theta}{\cot\theta} = \frac{\frac{\cancel{\cos\theta}}{1}\cdot\frac{1}{\cancel{\cos\theta}}}{\frac{\cos\theta}{\sin\theta}}$$

$$= \frac{1}{\frac{\cos\theta}{\sin\theta}}$$

$$= 1 \div \frac{\cos\theta}{\sin\theta}$$

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

$$= \tan\theta$$