

# Mr. Ward Answer Key

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1.  $\sin \theta \sec \theta = \tan \theta$

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

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

$$\tan \theta = \tan \theta$$

2.  $\cot(-\theta) = -\cot \theta$

$$\frac{1}{\tan(-\theta)} = -\cot \theta$$

$$-\frac{1}{\tan \theta} = -\cot \theta$$

$$-\cot \theta = -\cot \theta$$

3.  $\cos^2 \theta (\sec^2 \theta - 1) = \sin^2 \theta$

$$\cos^2 \theta (\tan^2 \theta) = \sin^2 \theta$$

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

$$\sin^2 \theta = \sin^2 \theta$$

4.  $\csc \theta \tan \theta$

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

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

5.  $(1 + \sec^2 \theta)(1 - \sin^2 \theta)$

$$\left(1 + \frac{1}{\cos^2 \theta}\right) \cos^2 \theta \quad (\text{Now Distribute})$$

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

6.  $\sin^2 \theta + \cos^2 \theta + \tan^2 \theta$

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

$$\sec^2 \theta$$

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

8.  $\sec \theta \cot \theta = \csc \theta$

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

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

$$\csc \theta = \csc \theta$$

9.  $\frac{\sin \theta - \cos \theta}{\sin \theta} = 1 - \cot \theta$

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

$$1 - \cot \theta = 1 - \cot \theta$$

10.  $\tan \theta \sin \theta = \sec \theta - \cos \theta$

$$\tan \theta \sin \theta = \frac{1}{\cos \theta} - \frac{\cos \theta}{1} \cdot \left(\frac{\cos \theta}{\cos \theta}\right) \quad \text{Getting Common Denominators}$$

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

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

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

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

$$\tan \theta \sin \theta = \tan \theta \cdot \sin \theta$$

11.  $\sec^2 \theta (1 - \cos^2 \theta) = \tan^2 \theta$

$$\frac{1}{\cos^2 \theta} \cdot \sin^2 \theta = \tan^2 \theta$$

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

$$\tan^2 \theta = \tan^2 \theta$$

12.  $\frac{\cos^2 \theta}{1 + \sin \theta}$

$$\frac{1 - \sin^2 \theta}{1 + \sin \theta} \rightarrow \frac{(1 + \cancel{\sin \theta})(1 - \cancel{\sin \theta})}{1 + \cancel{\sin \theta}} = 1 - \sin \theta$$

13.  $\frac{\tan \theta}{\cot \theta}$

$$\frac{\sin / \cos \theta}{\cos \theta / \sin \theta} \rightarrow \frac{\sin \theta}{\cos \theta} \cdot \frac{\sin \theta}{\cos \theta} = \frac{\sin^2 \theta}{\cos^2 \theta}$$

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

14.  $\cos \theta \cot \theta + \sin \theta$

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

$$\frac{\cos^2 \theta}{\sin \theta} + \frac{\sin \theta}{1} \cdot \left(\frac{\sin \theta}{\sin \theta}\right) \rightarrow$$

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

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

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

$$15. \frac{\sec^2 \theta - 1}{1 + \tan^2 \theta} \rightarrow \frac{\tan^2 \theta}{1 + \frac{\sin^2 \theta}{\cos^2 \theta}}$$

← Get Common Denominators

$$\frac{\tan^2 \theta}{\frac{\cos^2 \theta}{\cos^2 \theta} + \frac{\sin^2 \theta}{\cos^2 \theta}} \rightarrow \frac{\tan^2 \theta}{\frac{\cos^2 \theta + \sin^2 \theta}{\cos^2 \theta}}$$

$$\frac{\tan^2 \theta}{\frac{1}{\cos^2 \theta}} \rightarrow \frac{\tan^2 \theta}{1} \cdot \frac{\cos^2 \theta}{1}$$

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

$$17. \tan \theta \cot \theta$$

$$\tan \theta \cdot \frac{1}{\tan \theta} = \boxed{1}$$

$$19. \cos \theta + \sin \theta \tan \theta$$

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

$$\left(\frac{\cos \theta}{\cos \theta}\right) \cdot \cos \theta + \frac{\sin^2 \theta}{\cos \theta}$$

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

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

$$21. \cos^2 \theta \sec \theta \csc \theta$$

$$\left(\cos^2 \theta \cdot \frac{1}{\cos \theta}\right) \frac{1}{\sin \theta}$$

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

$$\cos \theta / \sin \theta = \boxed{\cot \theta}$$

$$23. \csc \theta (1 - \cos^2 \theta)$$

$$\frac{1}{\sin \theta} \cdot (\sin^2 \theta)$$

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

$$25. \frac{\sin \theta}{1 - \cos^2 \theta}$$

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

$$27. \frac{\tan \theta}{\sin \theta \sec \theta} \rightarrow \frac{\tan \theta}{\sin \theta \cdot \frac{1}{\cos \theta}}$$

$$= \frac{\tan \theta}{\sin / \cos \theta}$$

$$= \frac{\tan \theta}{\tan \theta}$$

$$= \boxed{1}$$

$$29. \tan \theta (\tan \theta + \cot \theta)$$

$$\tan^2 \theta + \tan \theta \cot \theta$$

$$\tan^2 \theta + \tan \theta \cdot \frac{1}{\tan \theta}$$

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

$$\boxed{\sec^2 \theta}$$

$$31. \sin^2 \theta \sec \theta \csc \theta$$

$$\sin^2 \theta \cdot \frac{1}{\cos \theta} \cdot \frac{1}{\sin \theta}$$

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