

Unit 7 Worksheet 1

$$\begin{aligned}
 1. \cos^3 \theta + \sin^2 \theta \cos \theta &= \cos \theta \\
 \cos \theta (\cos^2 \theta + \sin^2 \theta) &= \\
 \cos \theta (1) &= \\
 \cos \theta &= \checkmark
 \end{aligned}$$

$$\begin{aligned}
 2. \csc^2 \theta - \cos^2 \theta \csc^2 \theta &= 1 \\
 \csc^2 \theta (1 - \cos^2 \theta) &= \\
 \csc^2 \theta (\sin^2 \theta) &= \\
 \frac{1}{\sin^2 \theta} (\sin^2 \theta) &= \\
 1 &= 1
 \end{aligned}$$

$$\begin{aligned}
 3. \sec \theta \sin \theta &= \tan \theta \\
 \frac{1}{\cos \theta} \cdot \sin \theta &= \\
 \frac{\sin \theta}{\cos \theta} &= \\
 \tan \theta &= \tan \theta
 \end{aligned}$$

$$\begin{aligned}
 4. \frac{\csc \theta}{\sec \theta} &= \cot \theta \\
 \frac{1}{\sin \theta} \cdot \cos \theta &= \\
 \frac{\cos \theta}{\sin \theta} &= \\
 \cot \theta &= \cot \theta
 \end{aligned}$$

$$\begin{aligned}
 5. \frac{\sec^2 \theta - 1}{\tan \theta} &= \tan \theta \\
 \frac{\tan^2 \theta}{\tan \theta} &= \\
 \tan \theta &= \tan \theta
 \end{aligned}$$

$$\begin{aligned}
 6. \frac{\cot \theta}{\csc^2 \theta - 1} &= \tan \theta \\
 \frac{\cot \theta}{\cot^2 \theta} &= \\
 \frac{1}{\cot \theta} &= \\
 \tan \theta &= \tan \theta
 \end{aligned}$$

$$\begin{aligned}
 7. \sec \theta \sin^2 \theta \cot \theta &= 1 \\
 \frac{1}{\cos \theta} \sin \theta \frac{\cos \theta}{\sin \theta} &= \\
 1 &= 1
 \end{aligned}$$

$$\begin{aligned}
 8. \cot \theta \csc \theta \tan^2 \theta &= \sec \theta \\
 \frac{\cos \theta}{\sin \theta} \cdot \frac{1}{\sin \theta} \cdot \frac{\sin^2 \theta}{\cos^2 \theta} &= \\
 \frac{1}{\cos \theta} &= \\
 \sec \theta &= \sec \theta
 \end{aligned}$$

$$\begin{aligned}
 9. \cos^2 \theta - \sin^2 \theta &= 2\cos^2 \theta - 1 \\
 \cos^2 \theta - (1 - \cos^2 \theta) &= \\
 \cos^2 \theta - 1 + \cos^2 \theta &= \\
 2\cos^2 \theta - 1 &= 2\cos^2 \theta - 1
 \end{aligned}$$

$$\begin{aligned}
 10. \cos^2 \theta - \sin^2 \theta &= 1 - 2\sin^2 \theta \\
 (1 - \sin^2 \theta) - \sin^2 \theta &= \\
 1 - 2\sin^2 \theta &= 1 - 2\sin^2 \theta
 \end{aligned}$$

$$11. \cot \theta \sin \theta = \cos \theta$$

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

$$\cos \theta = \cos \theta$$

$$16. \cos \theta = \sec \theta - \sin \theta \tan \theta$$

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

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

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

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

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

$$\cos \theta = \cos \theta$$

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

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

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

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

$$\sin \theta = \sin \theta$$

$$13. \sin \theta (1 + \csc \theta) = \sin \theta + 1$$

$$\sin \theta + \sin \theta \csc \theta =$$

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

$$\sin \theta + 1 = \sin \theta + 1$$

$$17. (\sec \theta + \tan \theta)(\sec \theta - \tan \theta) = 1$$

$$\sec^2 \theta - \tan^2 \theta =$$

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

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

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

$$1 = 1$$

$$14. (1 + \tan \theta)^2 = \sec^2 \theta + 2 \tan \theta$$

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

$$(1 + \tan^2 \theta) + 2 \tan \theta =$$

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

$$18. \frac{\sec \theta}{\csc^2 \theta} = \sec \theta - \cos \theta$$

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

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

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

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

$$= \frac{1}{\csc \theta} \cdot \sec \theta$$

$$15. (1 + \tan^2 \theta) \cos^2 \theta = 1$$

$$\cos^2 \theta + \tan^2 \theta \cos^2 \theta =$$

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

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

$$1 = 1$$

$$19. \frac{1 - 2 \csc \theta}{\cot \theta} = \tan \theta - 2 \sec \theta$$

$$\frac{1}{\cot \theta} - \frac{2 \csc \theta}{\cot \theta} =$$

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

$$\tan \theta - \frac{2}{\cos \theta} =$$

$$\tan \theta - 2 \sec \theta = \tan \theta - 2 \sec \theta$$

$$20. \frac{\sec^2 \theta - 1}{\tan \theta} = \tan \theta$$

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

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

$$21. \sin \theta + \cos \theta \cot \theta = \csc \theta$$

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

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

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

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

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

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

$$22. \cos \theta (\csc \theta - \sec \theta) = \cot \theta - 1$$

$$\cos \theta \csc \theta - \cos \theta \sec \theta =$$

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

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

$$23. \frac{\cos \theta}{1 - \sin^2 \theta} = \sec \theta$$

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

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

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

$$\sec \theta = \sec \theta$$

$$\sec \theta = \sec \theta$$

$$\sec \theta = \sec \theta$$

$$24. \tan^2 \theta - \tan^2 \theta \sin^2 \theta = \sin^2 \theta$$

$$\tan^2 \theta (1 - \sin^2 \theta) =$$

$$\tan^2 \theta \cdot \cos^2 \theta =$$

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

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

$$25. \frac{\cot \theta}{1 + \cot^2 \theta} = \sin \theta \cos \theta$$

$$\frac{\cot \theta}{1 + \cot^2 \theta}$$

$$\frac{\cot \theta}{1 + \cot^2 \theta} =$$

$$\frac{\csc^2 \theta}{\csc^2 \theta}$$

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

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

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

$$26. \frac{1 + \tan^2 \theta}{\cos^2 \theta} = \sec^4 \theta$$

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

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

$$\frac{\sec^2 \theta}{\cos^2 \theta}$$

$$\sec^2 \theta \cdot \sec^2 \theta =$$

$$\sec^4 \theta = \sec^4 \theta$$

$$27. \frac{\sin \theta + \cos \theta}{\sin \theta \cos \theta} = \sec \theta + \csc \theta$$

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

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

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

$$\sec \theta + \csc \theta = \sec \theta + \csc \theta$$

$$\begin{aligned}
 28. \quad \sec \theta + \tan \theta &= \sin \theta \sec^2 \theta \\
 \frac{\sec \theta + \tan \theta}{\cos \theta + \frac{\sin \theta}{\cos \theta}} &= \\
 \frac{1 + \sin \theta}{\cos \theta + \frac{\sin \theta}{\cos \theta}} &= \\
 \frac{1 + \sin \theta}{\cos \theta} &= \\
 \frac{\cos \theta \sin \theta + \cos \theta}{\sin \theta} &= \\
 \frac{(1 + \sin \theta)}{\cos \theta} \cdot \frac{\sin \theta}{(\cos \theta \sin \theta + \cos \theta)} &= \\
 \frac{\sin \theta (1 + \sin \theta)}{\cos^2 \theta (\sin \theta + 1)} &= \\
 \frac{\sin \theta}{\cos^2 \theta} &= \\
 \sin \theta \sec^2 \theta &= \sin \theta \sec^2 \theta
 \end{aligned}$$

$$\begin{aligned}
 29. \quad \frac{(1 + \sin \theta)^2}{\cos^2 \theta} &= \frac{1 + \sin \theta}{1 - \sin \theta} \\
 \frac{(1 + \sin \theta)^2}{1 - \sin^2 \theta} &= \\
 \frac{(1 + \sin \theta)^2}{(1 + \sin \theta)(1 - \sin \theta)} &= \\
 \frac{1 + \sin \theta}{1 - \sin \theta} &= \frac{1 + \sin \theta}{1 - \sin \theta}
 \end{aligned}$$

$$30. \frac{1 + \sec \theta}{\tan \theta + \sin \theta} = \csc \theta$$

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

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

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

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

$$\frac{\cos \theta + 1}{\sin \theta (1 + \cos \theta)} = \csc \theta$$

$$\frac{\cancel{\cos \theta + 1}}{\sin \theta (1 + \cancel{\cos \theta})} = \csc \theta$$

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

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

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

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

$$\begin{aligned}
 31. \quad & \csc \theta \cos^2 \theta + \sin \theta = \csc \theta \\
 & \csc \theta \cos^2 \theta + \sin \theta \frac{\csc \theta}{\csc \theta} = \\
 & \csc \theta (\cos^2 \theta + \sin \theta \frac{1}{\csc \theta}) = \\
 & \csc \theta (\cos^2 \theta + \sin \theta \cdot \sin \theta) = \\
 & \csc \theta (\cos^2 \theta + \sin^2 \theta) = \\
 & \csc \theta (1) = \\
 & \csc \theta = \csc \theta
 \end{aligned}$$

$$\begin{aligned}
 32. \quad & \frac{\csc^2 \theta}{\csc^2 \theta - 1} = \sec^2 \theta \\
 & \frac{\csc^2 \theta}{\cot^2 \theta} = \\
 & \frac{1}{\sin^2 \theta} \cdot \frac{\sin^2 \theta}{\cos^2 \theta} = \\
 & \frac{1}{\cos^2 \theta} = \\
 & \sec^2 \theta = \sec^2 \theta
 \end{aligned}$$

$$\begin{aligned}
 33. \quad & \sin \theta \left(\frac{\cot \theta}{\sec \theta} + \csc \theta \right) = \cos^2 \theta + 1 \\
 & \sin \theta \left(\frac{\cos \theta}{\sin \theta} \cdot \cos \theta + \frac{1}{\sin \theta} \right) = \\
 & \sin \theta \left(\frac{\cos^2 \theta}{\sin \theta} + \frac{1}{\sin \theta} \right) = \\
 & \cos^2 \theta + 1 = \cos^2 \theta + 1
 \end{aligned}$$

$$\begin{aligned}
34. \quad \frac{2\cos^2\theta - \sin^2\theta + 1}{\cos\theta} &= 3\cos\theta \\
\frac{2\cos^2\theta + (\sin^2\theta + 1)}{\cos\theta} &= \\
\frac{2\cos^2\theta + \cos^2\theta}{\cos\theta} &= \\
\frac{3\cos^2\theta}{\cos\theta} &= \\
3\cos\theta &= 3\cos\theta
\end{aligned}$$

$$\begin{aligned}
35. \quad \csc\theta - \sin\theta &= \cot\theta \cos\theta \\
\frac{1}{\sin\theta} - \sin\theta &= \\
\frac{1}{\sin\theta} - \frac{\sin^2\theta}{\sin\theta} &= \\
\frac{1 - \sin^2\theta}{\sin\theta} &= \\
\frac{\cos^2\theta}{\sin\theta} &= \\
\frac{\cos\theta}{\sin\theta} \cdot \cos\theta &= \\
\cot\theta \cdot \cos\theta &= \cot\theta \cos\theta
\end{aligned}$$

$$\begin{aligned}
36. \quad \frac{1}{1+\cos\theta} + \frac{1}{1-\cos\theta} &= 2\csc^2\theta \\
\frac{1+\cos\theta + 1-\cos\theta}{(1+\cos\theta)(1-\cos\theta)} &= \\
\frac{2}{1-\cos^2\theta} &= \\
\frac{2}{\sin^2\theta} &= \\
2\csc^2\theta &= 2\csc^2\theta
\end{aligned}$$

$$37. \frac{1 + \tan \theta}{\tan \theta} = 1 + \cot \theta$$

$$\frac{1}{\tan \theta} + \frac{\tan \theta}{\tan \theta} =$$

$$\cot \theta + 1 =$$

$$1 + \cot \theta = 1 + \cot \theta$$

$$38. \frac{\cos \theta + \tan \theta}{\sin \theta} = \sec \theta + \cot \theta$$

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

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

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

$$\cot \theta + \sec \theta =$$

$$\sec \theta + \cot \theta = \sec \theta + \cot \theta$$

$$39. \csc^4 \theta - \cot^4 \theta = 2 \csc^2 \theta - 1$$

$$\frac{1}{\sin^4 \theta} - \frac{\cos^4 \theta}{\sin^4 \theta} = \frac{2}{\sin^2 \theta} - 1$$

$$\frac{1 - \cos^4 \theta}{\sin^4 \theta} = \frac{2 - \sin^2 \theta}{\sin^2 \theta}$$

$$\frac{(1 - \cos^2 \theta)(1 + \cos^2 \theta)}{\sin^4 \theta} = \frac{2 - \sin^2 \theta}{\sin^2 \theta}$$

$$\frac{(1 - \cos^2 \theta)(1 + \cos^2 \theta)}{(1 - \cos^2 \theta)(1 + \cos^2 \theta)} =$$

$$\frac{1 + \cos^2 \theta}{1 - \cos^2 \theta}$$

$$\frac{1 + \cos^2 \theta}{1 - \cos^2 \theta}$$

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

$$\Rightarrow \frac{1}{\sin^2 \theta} + \cot^2 \theta$$

$$\csc^2 \theta + (\csc^2 \theta - 1)$$

$$\csc^2 \theta + \csc^2 \theta - 1 =$$

$$2 \csc^2 \theta - 1 = \checkmark$$

$$40. \frac{\cos \theta + \cot \theta}{\csc \theta + 1} = \cos \theta$$

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

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

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

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

$$\frac{\cos \theta (\sin \theta + 1)}{(1 + \sin \theta)} =$$

$$\cos \theta = \cos \theta$$

$$41. \frac{1 + \sec \theta}{\tan \theta + \sin \theta} = \csc \theta$$

$$\begin{aligned} & \frac{1 + \frac{1}{\cos \theta}}{\frac{\sin \theta}{\cos \theta} + \frac{\sin \theta \cos \theta}{\cos \theta}} = \\ & \frac{\frac{\cos \theta + 1}{\cos \theta}}{\frac{\sin \theta (1 + \cos \theta)}{\cos \theta}} = \\ & \frac{\cos \theta}{\cos \theta} \cdot \frac{\cos \theta}{\sin \theta (1 + \cos \theta)} = \\ & \frac{1}{\sin \theta} = \\ & \csc \theta = \csc \theta \end{aligned}$$

$$\begin{aligned} 42. \frac{2 - \sec^2 \theta}{\sec \theta} &= \frac{1 - 2 \sin^2 \theta}{\cos \theta} \\ &= \frac{1 - 2(1 - \cos^2 \theta)}{\cos \theta} \\ &= \frac{1 - 2 + 2 \cos^2 \theta}{\cos \theta} \\ &= \frac{-1 + 2 \cos^2 \theta}{\cos \theta} \\ &= \frac{-1}{\cos \theta} + \frac{2 \cos^2 \theta}{\cos \theta} \\ &= -\sec \theta + 2 \cos \theta \\ &= -\sec \theta + \frac{2}{\sec \theta} \\ &= \frac{-\sec^2 \theta}{\sec \theta} + \frac{2}{\sec \theta} \\ &= \frac{2 - \sec^2 \theta}{\sec \theta} \end{aligned}$$

$$42 \quad \frac{1}{\sec\theta - \tan\theta} = \sec\theta + \tan\theta$$

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

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

$$\frac{\cos\theta(1 + \sin\theta)}{(1 - \sin\theta)(1 + \sin\theta)} =$$

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

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

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

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

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

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

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

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

$$\sec\theta + \tan\theta = \sec\theta + \tan\theta$$

$$44. 1 + \cos \theta = \cot \theta (\sin \theta + \tan \theta)$$

$$= \cot \theta \sin \theta + \cot \theta \tan \theta$$

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

$$= \cos \theta + 1$$

$$45. 1 - \sin \theta = \tan \theta (\cot \theta - \cos \theta)$$

$$= \tan \theta \cot \theta - \tan \theta \cos \theta$$

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

$$= 1 - \sin \theta$$

$$46. \frac{\tan \theta}{1 + \tan^2 \theta} = \sin \theta \cos \theta$$

$$\frac{\tan \theta}{\sec^2 \theta} =$$

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

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

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

$$\sin \theta \cdot \cos \theta = \sin \theta \cos \theta$$

$$47. \frac{(\sec \theta - \tan \theta)^2}{\left(\frac{1}{\cos \theta} - \frac{\sin \theta}{\cos \theta}\right)^2} = \frac{1 - \sin \theta}{1 + \sin \theta}$$

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

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

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

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

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

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$$48. \sqrt{\frac{1-\cos\theta}{1+\cos\theta}} = \frac{\cos\theta}{1-\sin\theta} \cdot \frac{1+\sin\theta}{\sin\theta}$$

$$\sqrt{\frac{(1-\cos\theta)(1-\cos\theta)}{(1+\cos\theta)(1-\cos\theta)}} =$$

$$\sqrt{\frac{(1-\cos\theta)^2}{1-\cos^2\theta}} =$$

$$\sqrt{\frac{(1-\cos\theta)^2}{\sin^2\theta}} =$$

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

$$49. \sqrt{\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta}} = \frac{1+\sin\theta}{\cos\theta}$$

$$\sqrt{\frac{\frac{1}{\cos\theta} + \frac{\sin\theta}{\cos\theta}}{\frac{1}{\cos\theta} - \frac{\sin\theta}{\cos\theta}}} =$$

$$\sqrt{\frac{\frac{1+\sin\theta}{\cos\theta}}{\frac{1-\sin\theta}{\cos\theta}}} =$$

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

$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta} \cdot \frac{(1+\sin\theta)}{(1+\sin\theta)}} =$$

$$\sqrt{\frac{(1+\sin\theta)^2}{1-\sin^2\theta}}$$

$$\sqrt{\frac{(1+\sin\theta)^2}{\cos^2\theta}} =$$

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