

$$\begin{array}{l|l} \textcircled{1} & \\ \hline \text{LS} & \text{RS} \\ \hline = \cos\theta \tan\theta & = \sin\theta \\ = \cos\theta \left(\frac{\sin\theta}{\cos\theta} \right) & \\ = \sin\theta & \\ \hline \text{LS} = \text{RS} & \end{array}$$

$$\begin{array}{l|l} \textcircled{2} & \\ \hline \text{LS} & \text{RS} \\ \hline = \frac{\cot\theta}{\tan\theta} & = \frac{1 - \sin^2\theta}{1 - \cos^2\theta} \\ = \left(\frac{\cos\theta}{\sin\theta} \right) & = \frac{\cos^2\theta}{\sin^2\theta} \\ \frac{\sin\theta}{\cos\theta} & \\ \hline = \left(\frac{\cos\theta}{\sin\theta} \right) \left(\frac{\cos\theta}{\sin\theta} \right) & \\ = \frac{\cos^2\theta}{\sin^2\theta} & \\ \hline \text{LS} = \text{RS} & \end{array}$$

$$\begin{array}{l|l} \textcircled{3} & \\ \hline \text{LS} & \text{RS} \\ \hline = \cot^2\theta & = \frac{\cos^2\theta}{1 - \cos^2\theta} \\ = \frac{\cos^2\theta}{\sin^2\theta} & = \frac{\cos^2\theta}{\sin^2\theta} \\ \hline \text{LS} = \text{RS} & \end{array}$$

$$\begin{array}{l|l} \textcircled{4} & \\ \hline \text{LS} & \text{RS} \\ \hline = \frac{\csc\theta}{\sec\theta} & = \cot\theta \\ = \left(\frac{1}{\sin\theta} \right) & = \frac{\cos\theta}{\sin\theta} \\ \left(\frac{1}{\cos\theta} \right) & \\ \hline = \left(\frac{1}{\sin\theta} \right) (\cos\theta) & \\ = \frac{\cos\theta}{\sin\theta} & \\ \hline \text{LS} = \text{RS} & \end{array}$$

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LS

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

RS

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

LS=RS

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LS

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

RS

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

LS=RS

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LS

$$\begin{aligned}
 &= \frac{1}{\sin^2\theta} + \frac{1}{\cos^2\theta} \\
 &= \frac{\cos^2\theta + \sin^2\theta}{\sin^2\theta\cos^2\theta} \\
 &= \frac{1}{\sin^2\theta\cos^2\theta}
 \end{aligned}$$

RS

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

LS=RS

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LS

$$= \cos^2\theta$$

RS

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

LS=RS

$$\begin{array}{l|l} \textcircled{9} & \\ \hline \text{LS} & \text{RS} \\ = \tan \theta & = \tan^2 \theta \cot \theta \\ & = \tan^2 \theta \left(\frac{1}{\tan \theta} \right) \\ & = \frac{\tan^2 \theta}{\tan \theta} \\ & = \tan \theta \end{array}$$

LS = RS

$$\begin{array}{l|l} \textcircled{10} & \\ \hline \text{LS} & \text{RS} \\ = \sec^2 \theta + \csc^2 \theta & = \sec^2 \theta \csc^2 \theta \\ = \frac{1}{\cos^2 \theta} + \frac{1}{\sin^2 \theta} & = \left(\frac{1}{\cos^2 \theta} \right) \left(\frac{1}{\sin^2 \theta} \right) \\ = \frac{\sin^2 \theta + \cos^2 \theta}{\cos^2 \theta \sin^2 \theta} & = \frac{1}{\cos^2 \theta \sin^2 \theta} \\ = \frac{1}{\cos^2 \theta \sin^2 \theta} & \end{array}$$

LS = RS

$$\begin{array}{l|l} \textcircled{11} & \\ \hline \text{LS} & \text{RS} \\ = \frac{1}{1+\sin \theta} + \frac{1}{1-\sin \theta} & = 2 \sec^2 \theta \\ = \frac{(1-\sin \theta) + (1+\sin \theta)}{(1+\sin \theta)(1-\sin \theta)} & = \frac{2}{\cos^2 \theta} \\ = \frac{1+1-\sin \theta + \sin \theta}{1-\sin^2 \theta} & \\ = \frac{2}{\cos^2 \theta} & \end{array}$$

LS = RS

$$\begin{array}{l|l} \textcircled{12} & \\ \hline \text{LS} & \text{RS} \\ = \tan^2 \theta - \sin^2 \theta & = \sin^2 \theta \tan^2 \theta \\ = \frac{\sin^2 \theta}{\cos^2 \theta} - \frac{\sin^2 \theta \cos^2 \theta}{\cos^2 \theta} & \\ = \frac{\sin^2 \theta - \sin^2 \theta \cos^2 \theta}{\cos^2 \theta} & \\ = \frac{\sin^2 \theta (1 - \cos^2 \theta)}{\cos^2 \theta} & \\ = \tan^2 \theta (1 - \cos^2 \theta) & \\ = \tan^2 \theta \sin^2 \theta & \end{array}$$

LS = RS

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LS

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

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

FACTOR

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

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

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

LS = RS

RS

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

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LS

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

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

$$\left(\frac{1}{\cos \theta} - \frac{\cos \theta}{\cos \theta} \right) (\cos \theta - 1)$$

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

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

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

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

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

$$= \frac{0}{1 - \cos \theta}$$

$$= 0$$

LS = RS

RS

$$= 0$$

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LS

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

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

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

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

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

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

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

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

RS

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

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

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

LS = RS

