

(17) p. 478 SGR

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$$\begin{aligned}\frac{1-\cos\theta}{1+\cos\theta} &= (\csc\theta - \cot\theta)^2 \\ &= \left(\frac{1}{\sin\theta} - \frac{\cos\theta}{\sin\theta}\right)^2 \\ &= \left(\frac{1-\cos\theta}{\sin\theta}\right)^2 \\ &= \frac{(1-\cos\theta)^2}{(\sin\theta)^2} \quad \text{from } \sin^2 + \cos^2 = 1 \\ &= \frac{(1-\cos\theta)^2}{1-\cos^2\theta} \\ &= \frac{(1-\cos\theta)(1-\cancel{\cos\theta})}{(1-\cancel{\cos\theta})(1+\cos\theta)}\end{aligned}$$

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