

$$1. \frac{\cot A}{\tan A} = \frac{\cot A}{\frac{1}{\cot A}} = \cot A \cdot \frac{\cot A}{1} = \cot^2 A$$

$$\frac{\frac{\cos A}{\sin A}}{\frac{\sin A}{\cos A}} = \frac{\cos A}{\sin A} \cdot \frac{\cos A}{\sin A} = \frac{\cos^2 A}{\sin^2 A} = \cot^2 A$$

2. $\cos x + \sin x \tan x$

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

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

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

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

$$\frac{1}{\cos x}$$

$$\sec x$$

$$3. \sin^2 \theta \cos^2 \theta - \cos^2 \theta$$

$$\cos^2 \theta (\sin^2 \theta - 1)$$

$$\cos^2 \theta (-\cos^2 \theta)$$

$$-\cos^4 \theta$$

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

$$\begin{aligned} 3) (1 - \cos^2 \theta) \cos^2 \theta - \cos^2 \theta \\ \cos^2 \theta - \cos^4 \theta - \cos^2 \theta \\ -\cos^4 \theta \end{aligned}$$

$$4. (\sin x + \cos x)^2 + (\sin x - \cos x)^2$$

$$(\sin x + \cos x)(\sin x + \cos x)$$

$$\sin^2 x + 2 \sin x \cos x + \cos^2 x + \sin^2 x - 2 \sin x \cos x + \cos^2 x$$

$$1 + 1$$

$$2$$

$$\begin{aligned} 2 \sin^2 x + 2 \cos^2 x \\ 2(\sin^2 x + \cos^2 x) \end{aligned}$$

$$2 \cdot 1$$

$$5. (1 + \cos \theta)(\csc \theta - \cot \theta)$$

$$\csc \theta - \cot \theta + \cos \theta \csc \theta - \cos \theta \cot \theta$$

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

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

$$\csc \theta - \cancel{\cot \theta} + \cancel{\cot \theta} - \frac{\cos^2 \theta}{\sin \theta}$$

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

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

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

$$\sin \theta$$

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

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

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

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

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


$$\frac{1-\cos x}{1-\cos x} \cdot \frac{\sin x}{1+\cos x} + \frac{\sin x}{1-\cos x} \cdot \frac{1+\cos x}{1+\cos x}$$

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

$$\frac{\sin x - \cancel{\sin x \cos x} + \sin x + \cancel{\sin x \cos x}}{1 - \cos^2 x}$$

$$\frac{2 \sin x}{\sin^2 x}$$

$$\frac{2}{\sin x} = 2 \left(\frac{1}{\sin x} \right)$$


 $2 \csc x$

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

$$6. \cos^4 \theta + 2 \cos^2 \theta \sin^2 \theta + \sin^4 \theta \quad \cos^2 \theta = 1 - \sin^2 \theta$$

$$\cos^2 \theta (\cos^2 \theta + 2 \sin^2 \theta) + \sin^4 \theta$$

$$(1 - \sin^2 \theta)(1 - \sin^2 \theta + 2 \sin^2 \theta) + \sin^4 \theta$$

$$(1 - \sin^2 \theta)(1 + \sin^2 \theta) + \sin^4 \theta$$

$$1 - \sin^4 \theta + \sin^4 \theta$$

$$1 - 2 \sin^4 \theta$$

$$\begin{array}{c|c} x^2 + 2x + 1 & x^4 + 2x^2 + 1 \\ (x+1)(x+1) & (x^2+1)(x^2+1) \end{array}$$

$$6. \cos^4 \theta + 2 \cos^2 \theta \sin^2 \theta + \sin^4 \theta$$

$$(\cos^2 \theta + \sin^2 \theta)(\cos^2 \theta + \sin^2 \theta)$$

$$\begin{array}{c} | \quad \cdot \quad | \\ \hline 1 \end{array}$$