$$
\text { 1. } \begin{aligned}
\frac{\cot A}{\tan A)} & \left.=\frac{\frac{\cos A}{\sin A}}{\frac{\sin A}{\cos A}}=\frac{\cos A}{\sin A} \cdot \frac{\cos A}{\sin A}=\frac{\cos ^{2} A}{\sin ^{2} A}=\cot ^{2} A\right) \\
& =\frac{\cot A}{\frac{1}{\cot A}}=\cot A \cdot \frac{\cot A}{1}=\cot ^{2} A
\end{aligned}
$$

$$
\begin{aligned}
& \text { 2. } \cos x+\sin x \tan x \\
& \cos x+\sin x \frac{\sin x}{\cos x} \frac{\cos x}{=\cos x} \frac{\cos x}{1}+\frac{\sin ^{2} x}{\cos x} \\
& \frac{\cos ^{2} x}{\cos x}+\frac{\sin ^{2} x}{\cos x}=\frac{\cos ^{2} x+\sin ^{2} x}{\cos x}=\frac{1}{\cos x}=\sec x
\end{aligned}
$$

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

$$
\begin{gathered}
(1+\cos \theta)\left(\frac{1}{\sin \theta}-\frac{\cos \theta}{\sin \theta}\right) \\
\left(\frac{1+\cos \theta}{1}\right)\left(\frac{1-\cos \theta}{\sin \theta}\right)
\end{gathered} \left\lvert\, \begin{gathered}
\cos \theta-\cot \theta+\cos \theta \csc \theta-\cos \theta \cot \theta \\
\frac{1}{\sin \theta}-\cot \theta+\cos \theta \frac{1}{\sin \theta}-\cos \theta \frac{\cos \theta}{\sin \theta} \\
+\frac{\cos \theta}{\sin \theta} \\
\begin{array}{c}
\sin ^{2} \theta \\
\sin \theta \\
\sin \theta
\end{array} \\
\frac{1}{\sin \theta}-\cot \theta+\cot \theta-\frac{\cos ^{2} \theta}{\sin \theta} \\
1-\cos ^{2} \theta
\end{gathered}\right.
$$

$$
\begin{aligned}
& \frac{1-\cos x \sin x}{1-\cos x 1+\cos x}+\frac{\sin x}{1-\cos x} \frac{1+\cos x}{1+\cos x} / \sin x\left(\frac{1}{1+\cos x}+\frac{1}{1-\cos x}\right) \\
& \frac{\sin x-\sin x \cos x}{1-\cos ^{2} x}+\frac{\sin x+\sin x \cos x}{1-\cos ^{2} x} \\
& \frac{2 \sin x-\sin x \cos x+\sin x+\sin x \cos x}{1-\cos ^{2} x} \\
& \frac{\sin ^{2} x}{\sin x}=2\left(\frac{1}{\sin x}\right) \\
& 2 \cos x
\end{aligned}
$$

$$
\begin{array}{cc}
\begin{array}{cc}
\frac{6}{\cos ^{4} \theta+2 \cos ^{2} \theta \sin ^{2} \theta} \sin ^{4} \theta & \sin ^{2} \theta+\cos ^{2} \theta=1 \\
\cos ^{2} \theta\left(\cos ^{2} \theta+2 \sin ^{2} \theta\right)-1-\sin ^{2} \theta
\end{array} \\
\begin{array}{c}
\left(1-\sin ^{2} \theta\right)\left(1-\sin ^{2} \theta+2 \sin ^{2} \theta\right)-\sin ^{4} \theta
\end{array} & \sin ^{2} \theta \sin ^{2} \theta \\
\left.\left(1-\sin ^{2} \theta\right)\left(1+\sin ^{2} \theta\right)-\sin ^{4} \theta\right) & \left(1-\cos ^{2} \theta\right)\left(1-\cos ^{2} \theta\right) \\
1-\sin ^{4} \theta-\sin ^{4} \theta & \left(1-2 \cos ^{4} \theta+\cos ^{4} \theta\right) \\
1-2 \sin ^{4} \theta &
\end{array}
$$

$$
\left.\frac{\begin{array}{c}
x^{2}+2 x+1 \\
(x+1)(x+1) \\
(x+1)^{2}
\end{array}}{\substack{x^{4}+2 x^{2}+1^{4} \\
\left(x^{2}+1\right)\left(x^{2}+1\right)}} \begin{gathered}
6 \cdot \cos ^{4} \theta+2 \cos ^{2} \theta \sin ^{2} \theta+\sin ^{4} \theta \\
\left(\cos ^{2} \theta+\sin ^{2} \theta\right)\left(\cos ^{2} \theta+\sin ^{2} \theta\right) /\left(\left(\cos ^{2} \theta+\sin ^{2} \theta\right)^{2}\right.
\end{gathered}\right|^{2}
$$

