

7.

$$\frac{\sin 3B}{\sin B \cos B} = 4 \cos B - \sec B$$

$$\begin{aligned}\sin 3B &= \sin(B + 2B) = \sin B \cos 2B + \cos B \sin 2B \\ &= \sin B (2 \cos^2 B - 1) + \cos B \cdot 2 \sin B \cos B \\ &= \underline{2 \sin B \cos^2 B} - \sin B + \underline{2 \sin B \cos^2 B} \\ &= 4 \sin B \cos^2 B - \sin B\end{aligned}$$

$$\frac{4 \sin B \cos^2 B - \sin B}{\sin B \cos B}$$

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

$$= 4 \cos B - \frac{1}{\cos B}$$

$$= 4 \cos B - \sec B \quad \square$$

7.

$$\frac{\sin 3\beta}{\sin \beta \cos \beta} = 4 \cos \beta - \sec \beta$$

$$\begin{aligned} \sin 3\beta &= \sin(\beta + 2\beta) = \sin \beta \cos 2\beta + \cos \beta \sin 2\beta \\ &= \sin \beta (2 \cos^2 \beta - 1) + \cos \beta \cdot 2 \sin \beta \cos \beta \\ &= \underline{2 \sin \beta \cos^2 \beta} - \sin \beta + \underline{2 \sin \beta \cos^2 \beta} \\ &= 4 \sin \beta \cos^2 \beta - \sin \beta \end{aligned}$$

$$\frac{4 \sin \beta \cos^2 \beta - \sin \beta}{\sin \beta \cos \beta}$$

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

$$= 4 \cos \beta - \frac{1}{\cos \beta}$$

$$= 4 \cos \beta - \sec \beta. \quad \square$$