

Divide numerator and denominator by θ . ($\sin \theta$ also works.)

$$\begin{aligned}\lim_{\theta \rightarrow 0} \frac{\sin 7\theta}{\theta + \tan 4\theta} &= \lim_{\theta \rightarrow 0} \frac{\frac{\sin 7\theta}{\theta}}{1 + \frac{\sin 4\theta}{\theta} \cdot \frac{1}{\cos 4\theta}} = \frac{\lim_{\theta \rightarrow 0} \frac{\sin 7\theta}{\theta}}{1 + \lim_{\theta \rightarrow 0} \frac{\sin 4\theta}{\theta} \lim_{\theta \rightarrow 0} \frac{1}{\cos 4\theta}} \\ &= \frac{7}{1 + 4 \cdot 1} = \frac{7}{5}\end{aligned}$$