

$$\begin{aligned}
& \lim_{x \rightarrow 0} \frac{\sqrt{1+x \cos x} - \sqrt{1+x}}{x^3} \\
&= \lim_{x \rightarrow 0} \frac{x(\cos x - 1)}{\left(\sqrt{1+x \cos x} + \sqrt{1+x}\right) x^3} \\
&= \lim_{x \rightarrow 0} \frac{x \cdot \left(-\frac{1}{2} x^2\right)}{2x^3} \\
&= -\frac{1}{4}
\end{aligned}$$