

$$\begin{aligned}
8.7 \quad (\sin(x))' &= \lim_{h \rightarrow 0} \frac{\sin(x+h) - \sin(x)}{h} = \\
&\lim_{h \rightarrow 0} \frac{\sin(x) \cos(h) + \cos(x) \sin(h) - \sin(x)}{h} = \\
&\lim_{h \rightarrow 0} \frac{\cos(x) \sin(h)}{h} + \frac{\sin(x) (\cos(h) - 1)}{h} = \\
&\lim_{h \rightarrow 0} \frac{\cos(x) \sin(h)}{h} + \lim_{h \rightarrow 0} \frac{\sin(x) (\cos(h) - 1)}{h} = \\
&\cos(x) \lim_{h \rightarrow 0} \frac{\sin(h)}{h} + \sin(x) \lim_{h \rightarrow 0} \frac{\cos(h) - 1}{h} = \cos(x) \cdot 1 + \sin(x) \cdot 0 = \cos(x)
\end{aligned}$$