

$$\begin{aligned}
&= \lim_{h \rightarrow 0} \frac{nx^{n-1}h + \binom{n}{2}x^{n-2}h^2 + \cdots + \binom{n}{n-1}xh^{n-1} + h^n}{h} \\
&= \lim_{h \rightarrow 0} \frac{\cancel{h} \left(nx^{n-1} + \binom{n}{2}x^{n-2}\cancel{h} + \cdots + \binom{n}{n-1}xh^{n-2} + h^{n-1} \right)}{\cancel{h}} \\
&= \lim_{h \rightarrow 0} \left(nx^{n-1} + \binom{n}{2}x^{n-2}h + \cdots + \binom{n}{n-1}xh^{n-2} + h^{n-1} \right) \\
&= \boxed{nx^{n-1}}, \\
&\quad \text{given}
\end{aligned}$$