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$$
\begin{aligned}
&e^x \sin x \\
&= \left\{1 + x + \frac{1}{2}x^2 + o(x^2)\right\}\left\{x - \frac{1}{6}x^3 + o(x^3)\right\}
\end{aligned}
$$

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$$
\begin{aligned}
&= x + x^2 + \frac{1}{3}x^3 \\
&\qquad - \frac{1}{6}x^4 - \frac{1}{12}x^5 + \left\{1 + x + \frac{1}{2}x^2\right\} o(x^3) \\
&\qquad\qquad + \left\{x - \frac{1}{6}x^3\right\} o(x^2) + o(x^3)o(x^3)
\end{aligned}
$$

$-\frac{1}{6}x^4$ 以降の部分を評価すると，

$$\begin{aligned}
&o(x^3) + o(x^4) \\
&+ o(x^3) + o(x^4) + o(x^5) + o(x^3) + o(x^5) + o(x^5) \\
&\qquad\qquad = o(x^3)
\end{aligned}$$

したがって，

$$e^x \sin x = x + x^2 + \frac{1}{3}x^3 + o(x^3)$$