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Exercise 1. Fill in the blank:

$$\ln(1+x) \cosh(x) \underset{x \rightarrow 0}{=} x - \frac{x^2}{2} + \frac{5}{6}x^3 - \frac{13}{24}x^4 + o(x^4)$$

$$\frac{\sin(x)}{\ln(1+x)} \underset{x \rightarrow 0}{=} 1 + \frac{x^2}{2} - \frac{2x^3}{3} + o(x^3)$$

Exercise 2. Fill in the blank with the Taylor-Young expansion of usual functions. Do not use ellipses (i.e., "dots") or the  $\sum$  symbol.

$$\ln(1+x) \underset{x \rightarrow 0}{=} x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5} + o(x^5)$$

$$\sin(x) \underset{x \rightarrow 0}{=} x - \frac{x^3}{3!} + \frac{x^5}{5!} + o(x^5)$$

$$e^x \underset{x \rightarrow 0}{=} 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + o(x^5)$$