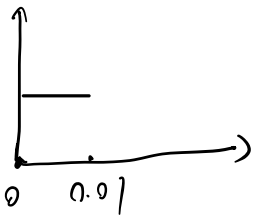
$f(x) = \exp(\sin(x))$

$f(0) = 1$

问：$f(0.01)$ 等于多少？

⇒ 估算

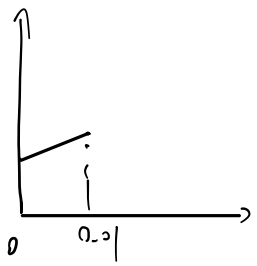


① 0.01 离 0 不远

$f(0.01)$ 和 $f(0)$ 很接近

② 从 0 移动到 0.01，f 变化了一点。

$\frac{\Delta f(x)}{\Delta x}$ 这是一阶导的概念



$$f'(0) \approx \frac{f(0.01) - f(0)}{0.01 - 0}$$

③ 由此可推及更高阶导数

公式：$f(x) = f(a) + f'(a)(x-a) + \frac{1}{2} f''(a)(x-a)^2 + \cdots$

例：$f(x) = \exp(\sin(x))$

$f'(x) = \exp(\sin(x)) \cos x$

$f''(x) = \exp(\sin(x)) \cos^2 x - \exp(\sin(x)) \sin x$.