

【Taylor 展開】 (参考)

No. _____

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$$\textcircled{1} \quad f(x+\Delta x) = f(x) + f'(x)\Delta x + \frac{1}{2}f''(x)(\Delta x)^2 + \dots$$

【 $(\Delta x)^2$ の 2 階まで証明を示す】

(1) Δx の 1 次 :

$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{f(x+\Delta x) - f(x)}{\Delta x}$$

0.5

$$\therefore f(x+\Delta x) = f(x) + f'(x)\Delta x$$

(2) $(\Delta x)^2$ の 2 階 :

$$f(x+\Delta x) = f(x) + f'(x)\Delta x + \underbrace{X(x)(\Delta x)^2}$$

∴ x と $x+\Delta x$ とが近いほど $X(x)$ とおくと

$$f(x+2\Delta x) = f(x+\Delta x) + f'(x+\Delta x)\Delta x + X(x+\Delta x)(\Delta x)^2$$

