

Exempel: Beräkna  $f^{(4)}(0)$  och  $f^{(5)}(0)$  då  $f(x) = e^{x^2}$ .

Lösning:  $e^t = 1 + t + \frac{t^2}{2} + O(t^3)$

$$e^{x^2} = 1 + x^2 + \frac{x^4}{2} + O(x^6)$$

$$f(x) = e^{x^2} = f(0) + f'(0)x + \frac{f''(0)}{2}x^2 + \frac{f^{(3)}(0)}{3!}x^3 + \frac{f^{(4)}(0)}{4!}x^4 + \frac{f^{(5)}(0)}{5!}x^5 + O(x^6)$$

$$\frac{f^{(4)}(0)}{4!} = \frac{1}{2} \Leftrightarrow f^{(4)}(0) = \frac{4!}{2} = \underline{\underline{12}} \quad f^{(5)}(0) = \underline{\underline{0}}$$