

乘法的微分公式

$$(1) f(x) = (x^2 + 4x + 5) \cdot (3x^5 - 2x + 3)$$

$$f'(x) = (2x + 4)(3x^5 - 2x + 3) + (x^2 + 4x + 5)(15x^4 - 2) \quad \#$$

$$(2) f(x) = (x^4 + 3x) e^x$$

$$f'(x) = (4x^3 + 3) e^x + (x^4 + 3x) e^x \quad \#$$

$$(3) f(x) = e^x \cdot \ln x$$

$$f'(x) = e^x \ln x + e^x \frac{1}{x} \quad \#$$

$$(4) f(x) = (x^2 + 5x)^{10} \sin x$$

$$f'(x) = 10(x^2 + 5x)^9 (2x + 5) \sin x + (x^2 + 5x)^{10} \cos x \quad \#$$

$$(5) f(x) = (4x^3 + 8x - 2) e^{5x^2}$$

$$f'(x) = (12x^2 + 8) e^{5x^2} + (4x^3 + 8x - 2) e^{5x^2} (10x) \quad \#$$

$$6. f(x) = (x^2 + 6x)^4 \cdot e^{4x} \cdot \ln x$$

$$f'(x) = 4(x^2 + 6x)^3 (2x + 6) e^{4x} \ln x + (x^2 + 6x)^4 [e^{4x} \cdot \ln x]'$$

$$= 4(x^2 + 6x)^3 (2x + 6) e^{4x} \ln x + (x^2 + 6x)^4 [e^{4x} \cdot 4 \ln x + e^{4x} \frac{1}{x}] \quad \#$$