

DS3

16 oct '2015.

$$\textcircled{1} f_1(x) = \frac{1}{(x^2+1)^3} = (x^2+1)^{-3} \quad \text{avec } x \in \mathbb{R}.$$

$$\begin{aligned} \text{D'au } f_1'(x) &= -3 \cdot (x^2+1)^{-4} \cdot 2x \\ &= \frac{-6x}{(x^2+1)^4}. \end{aligned}$$

$$\textcircled{2} f_2(x) = (2x^3 + 2x^2)^5; \quad x \in \mathbb{R}$$

$$\begin{aligned} f_2'(x) &= 5(2x^3 + 2x^2)^4 (6x^2 + 4x) \\ &= 10(2x^3 + 2x^2)^4 (3x^2 + 2x) \end{aligned}$$

$$\textcircled{3} f_3(x) = \left(\frac{3x^2+5}{x+2} \right)^3; \quad x \neq -2$$

$$\begin{aligned} f_3'(x) &= 3 \cdot \left(\frac{3x^2+5}{x+2} \right)^2 \cdot \frac{(x+2)(6x) - (3x^2+5)}{(x+2)^2} \\ &= \frac{3}{(x+2)^4} \times (3x^2+5)^2 \times (3x^2+12x-5) \end{aligned}$$

$$\textcircled{4} f_4(x) = \frac{3x-5}{\sqrt{x^2+2}}; \quad x \in \mathbb{R}$$

$$\begin{aligned} f_4'(x) &= \frac{\sqrt{x^2+2} \times 3 - (3x-5) \times \frac{2x}{2\sqrt{x^2+2}}}{x^2+2} \\ &= \frac{(x^2+2) \times 3 - (3x-5)}{(x^2+2)\sqrt{x^2+2}} = \frac{5x+6}{(x^2+2)\sqrt{x^2+2}} \end{aligned}$$

$$\textcircled{5} f_5(x) = \sqrt{\sqrt{3x+1}}; \quad x \geq 0$$

$$f_5'(x) = \frac{(\sqrt{3x+1})'}{2\sqrt{\sqrt{3x+1}}} = \frac{\frac{3}{2\sqrt{3x+1}}}{2\sqrt{\sqrt{3x+1}}} = \frac{3}{4\sqrt{3x+1}\sqrt{\sqrt{3x+1}}}$$