

1.1.10

$$2) f(x) = \frac{\ln(2x+3)}{\ln(2)}$$

$$2x+3 > 0 \Leftrightarrow x > -\frac{3}{2}$$

$$\Rightarrow \text{ED}_f = ]-\frac{3}{2}; +\infty[$$

$$f'(x) = \left( \frac{\ln(2x+3)}{\ln(2)} \right)' = \frac{(\ln(2x+3))' \cdot \ln(2) - \ln(2x+3) \cdot 0}{(\ln(2))^2}$$

$$= \frac{\frac{(2x+3)'}{2x+3} \cdot \ln(2)}{\ln(2) \cdot \ln(2)} = \frac{2}{2x+3}$$

$$b) f(x) = \frac{\ln(x^2 - 2x + 1)}{\ln(3)}$$

$$x^2 - 2x + 1 > 0 \Leftrightarrow (x-1)^2 > 0 \Leftrightarrow x \neq 1$$

$$\Rightarrow \text{ED}_f = \mathbb{R} - \{1\}$$

1.1.10

3MS

$$f'(x) = \left( \frac{\ln(x^2 - 2x + 1)}{\ln(3)} \right)'$$

$$= \frac{(\ln(x^2 - 2x + 1))' \cdot \ln(3) - \ln(x^2 - 2x + 1) (\ln(3))'}{(\ln(3))^2}$$

$$= \frac{\frac{(x^2 - 2x + 1)'}{x^2 - 2x + 1} \cdot \cancel{\ln(3)}}{\ln(3) \cdot \cancel{\ln(3)}}$$

$$= \frac{2x - 2}{x^2 - 2x + 1} \cdot \frac{1}{\ln(3)} = \frac{2(x-1)}{(x-1)^2} \cdot \frac{1}{\ln(3)}$$

$$= \frac{2}{x-1} \cdot \frac{1}{\ln(3)}$$

1.1.10

3MS

$$c) f(x) = e^{(2x-4) \cdot \ln(3)}$$

$$\text{ED}(2x-4) = \mathbb{R} \Rightarrow \text{ED}_f = \mathbb{R}$$

$$\begin{aligned} f'(x) &= \left( e^{(2x-4) \cdot \ln(3)} \right)' \\ &= e^{(2x-4) \cdot \ln(3)} \cdot \left( (2x-4) \cdot \ln(3) \right)' \\ &= e^{(2x-4) \cdot \ln(3)} \cdot \ln(3) \cdot (2x-4)' \\ &= 3^{2x-4} \cdot \ln(3) \cdot 2 \end{aligned}$$

$$d) x^2 + 1 > 0 \Rightarrow \sqrt{x^2 + 1} \text{ existe } \forall x \in \mathbb{R}$$

$$\Rightarrow \text{ED}_f = \mathbb{R}$$

1.1.10

BMS

4

$$\left( \exp_2(\sqrt{x^2+1}) \right)' = \left( 2^{\sqrt{x^2+1}} \right)'$$

$$= \left( e^{\sqrt{x^2+1} \cdot \ln(2)} \right)'$$

$$= e^{\sqrt{x^2+1} \cdot \ln(2)} \cdot \left( \sqrt{x^2+1} \cdot \ln(2) \right)'$$

$$= 2^{\sqrt{x^2+1}} \cdot \ln(2) \cdot (\sqrt{x^2+1})'$$

$$= 2^{\sqrt{x^2+1}} \cdot \ln(2) \cdot \frac{(x^2+1)'}{2\sqrt{x^2+1}}$$

$$= 2^{\sqrt{x^2+1}} \cdot \ln(2) \cdot \frac{2x}{2\sqrt{x^2+1}}$$

$$= 2^{\sqrt{x^2+1}} \cdot \ln(2) \cdot \frac{x}{\sqrt{x^2+1}}$$