

$$\textcircled{a} f(x) = e^{-2x} \longrightarrow Df'(x) = e^{-2x} \cdot (-2) = \boxed{\frac{-2}{e^{2x}}}$$

$$\boxed{(e^{f(x)})' = e^{f(x)} \cdot f'(x)}$$

$$\textcircled{b} f(x) = \ln(3x^2 + 5) \longrightarrow Df'(x) = \frac{1}{3x^2 + 5} \cdot 6x$$

$$\boxed{(\ln f(x))' = \frac{1}{f(x)} \cdot f'(x)} = \boxed{\frac{6x}{3x^2 + 5}}$$

$$\textcircled{c} f(x) = \ln [3x^2 \cdot (5x^3 - 7)^4] = \ln(3x^2) + \ln(5x^3 - 7)^4$$

$$\boxed{\ln(A \cdot B) = \ln A + \ln B}$$

$$= \ln(3x^2) + 4 \cdot \ln(5x^3 - 7)$$

$$\boxed{(\ln A^n) = n \cdot \ln A}$$

$$f'(x) = \frac{1}{3x^2} \cdot 6x + 4 \cdot \frac{1}{5x^3 - 7} \cdot 15x^2 =$$

$$\boxed{\begin{aligned} (u f(x))' &= u \cdot f'(x) \\ (\ln f(x))' &= \frac{1}{f(x)} \cdot f'(x) \end{aligned}}$$

$$= \frac{6x}{3x^2} + \frac{60x^2}{5x^3 - 7}$$

$$= \boxed{\frac{2}{x} + \frac{60x^2}{5x^3 - 7}}$$