

$$(1) \ e^{-2}$$

$$(2) \ \sqrt{2}$$

$$D_f = \mathbb{R}, \quad D_{f'} = \mathbb{R} \setminus \{0\}, \quad f'(x) = \frac{4}{\sqrt{2}} \frac{\operatorname{sgn}(x)}{x^2+1}, \quad f'_+(0) = \frac{4}{\sqrt{2}}, \quad f'_-(0) = -\frac{4}{\sqrt{2}}$$