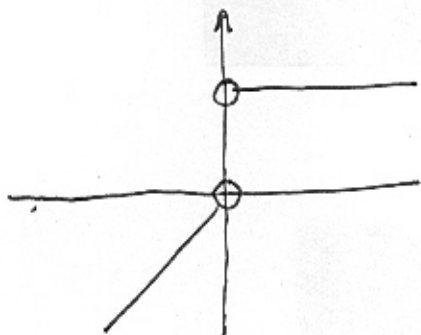


①



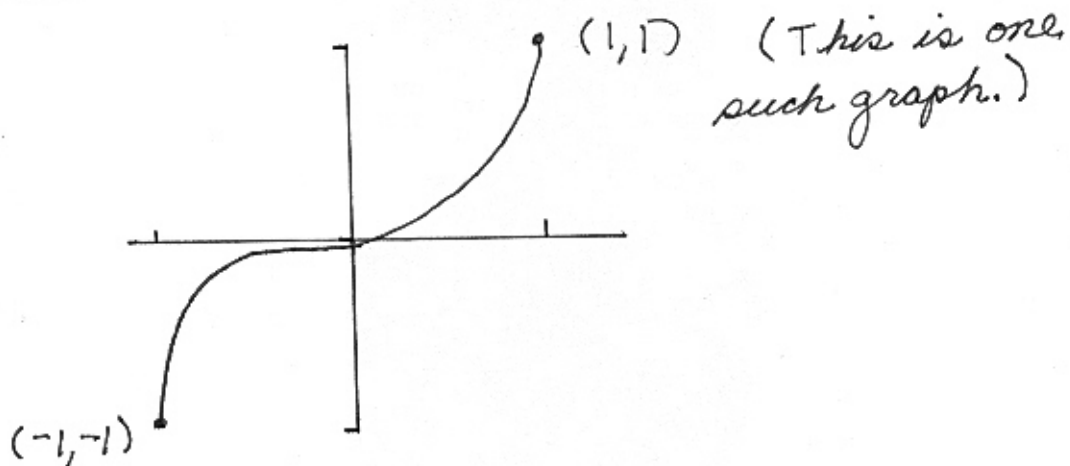
$$\textcircled{2} \lim_{h \rightarrow 0} \frac{\frac{1}{(x+h)^2} - \frac{1}{x^2}}{h} = \lim_{h \rightarrow 0} \left\{ \frac{x^2 - (x+h)^2}{h(x+h)^2 x^2} \right\}$$

$$= \lim_{h \rightarrow 0} \frac{x^2 - (x^2 + 2xh + h^2)}{h(x+h)^2 x^2} = \lim_{h \rightarrow 0} \frac{-2xh - h^2}{h(x+h)^2 x^2}$$

$$= \lim_{h \rightarrow 0} \frac{-h(2x+h)}{h(x+h)^2 x^2} = \lim_{h \rightarrow 0} \frac{-(2x+h)}{(x+h)^2 x^2}$$

$$= \frac{-2x}{(x^2)(x^2)} = \boxed{\frac{-2}{x^3}}$$

③



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(4) (a)  $\frac{df}{dx} = 2x + e^x$ ; (b)  $\frac{df}{dx} = \frac{2Mmg}{x^3}$ .