

1. For the function $f(x) = 1/x$ compute the derivative function from the definition using limits.

$$f'(a) = \lim_{h \rightarrow 0} \frac{\frac{1}{a+h} - \frac{1}{a}}{h}$$

$$= \lim_{h \rightarrow 0} \frac{a - (a+h)}{(a+h) \cdot a} \cdot \frac{1}{h}$$

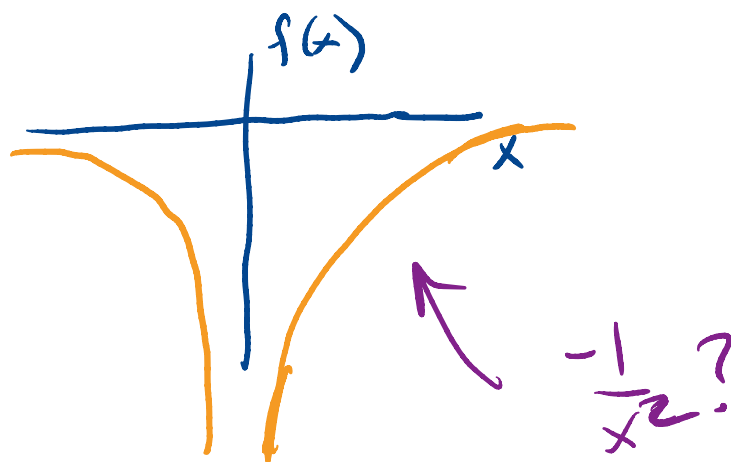
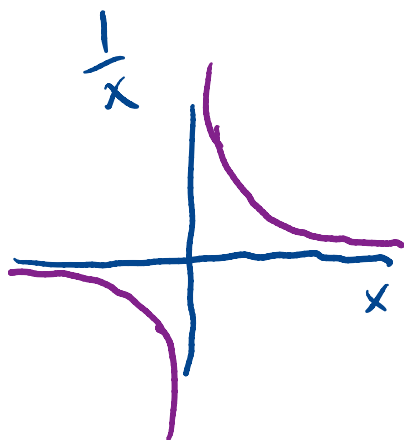
$$= \lim_{h \rightarrow 0} \frac{-h}{(a+h) \cdot a} \cdot \frac{1}{h} = \lim_{h \rightarrow 0} \frac{-1}{(a+h) \cdot a} = \frac{-1}{(a+0) \cdot a} = \frac{-1}{a^2}$$

$$f'(a) = -\frac{1}{a^2}$$

$$f'(x) = -\frac{1}{x^2}$$

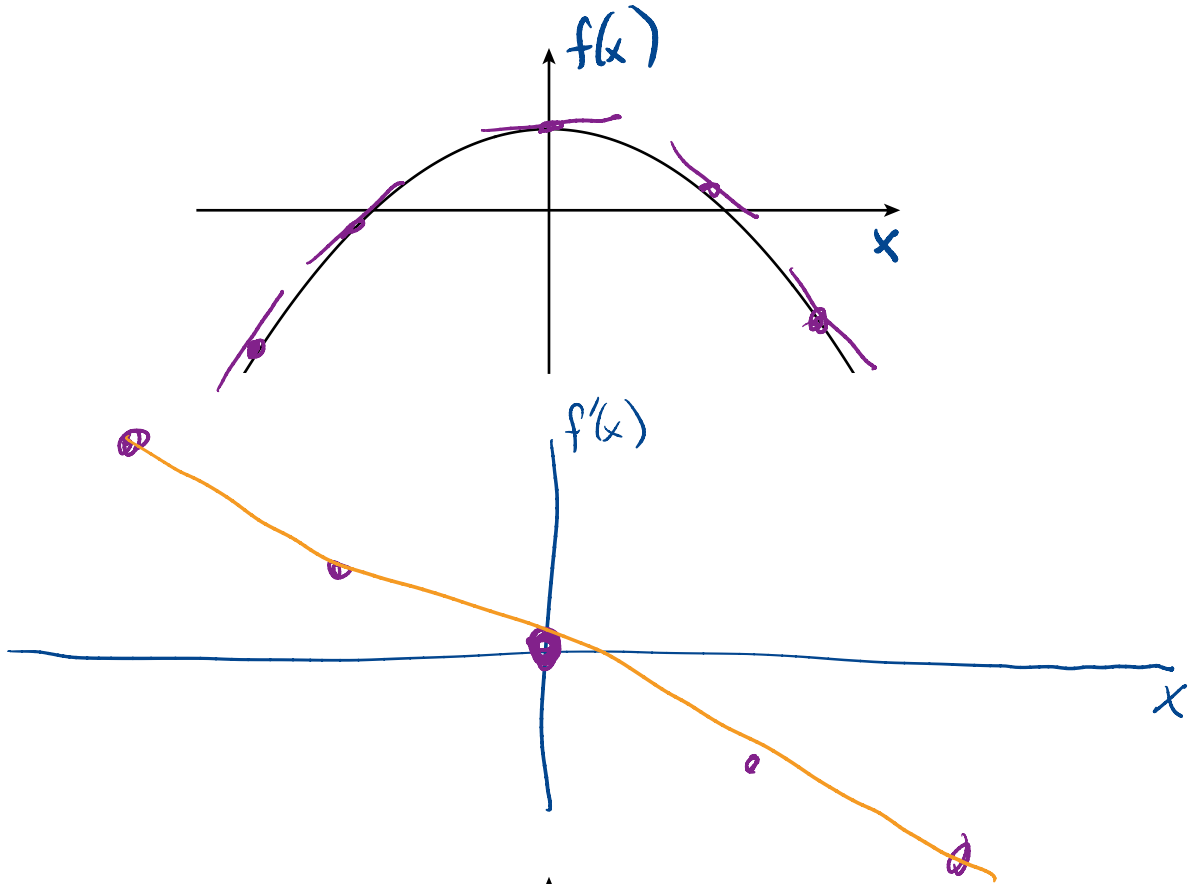
2. Find the equation of the tangent line to the curve $y = 1/x$ at $x = 2$. (see next worksheet)

$$f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h} \quad \frac{\Delta f}{\Delta x}$$

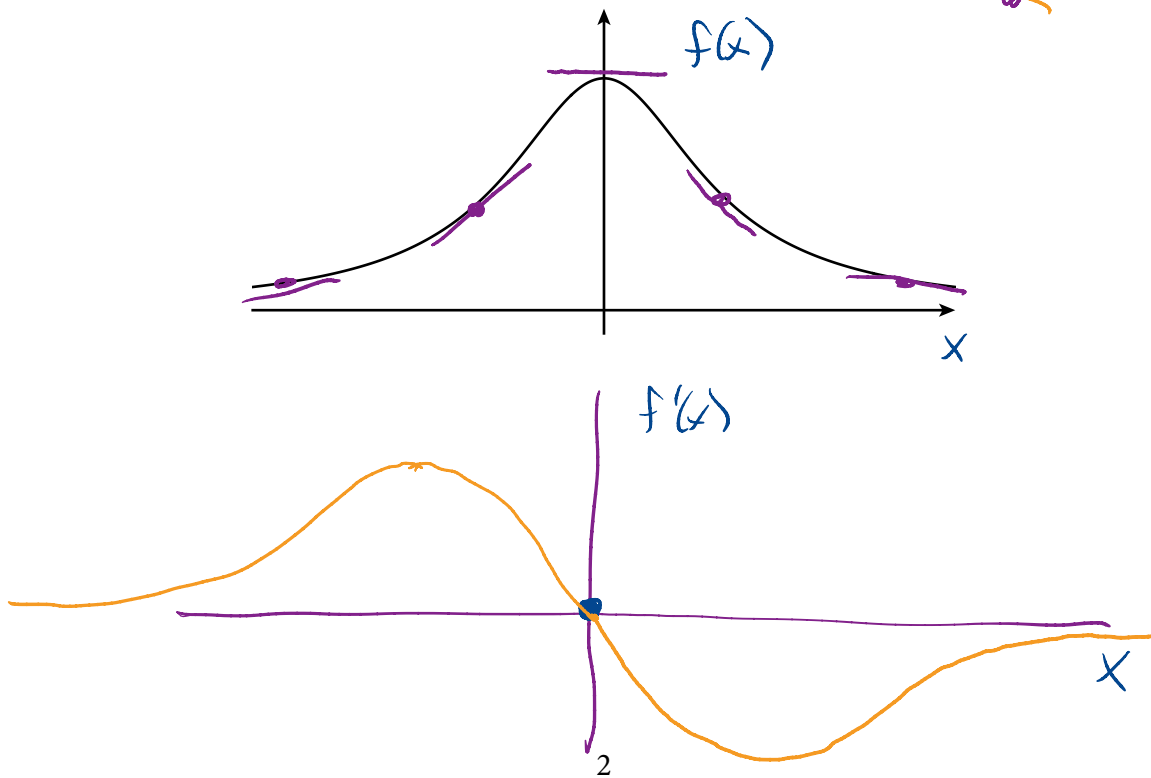


For each of the remaining problems I have sketched for you the graph of $f(x)$. Your job: sketch $f'(x)$.

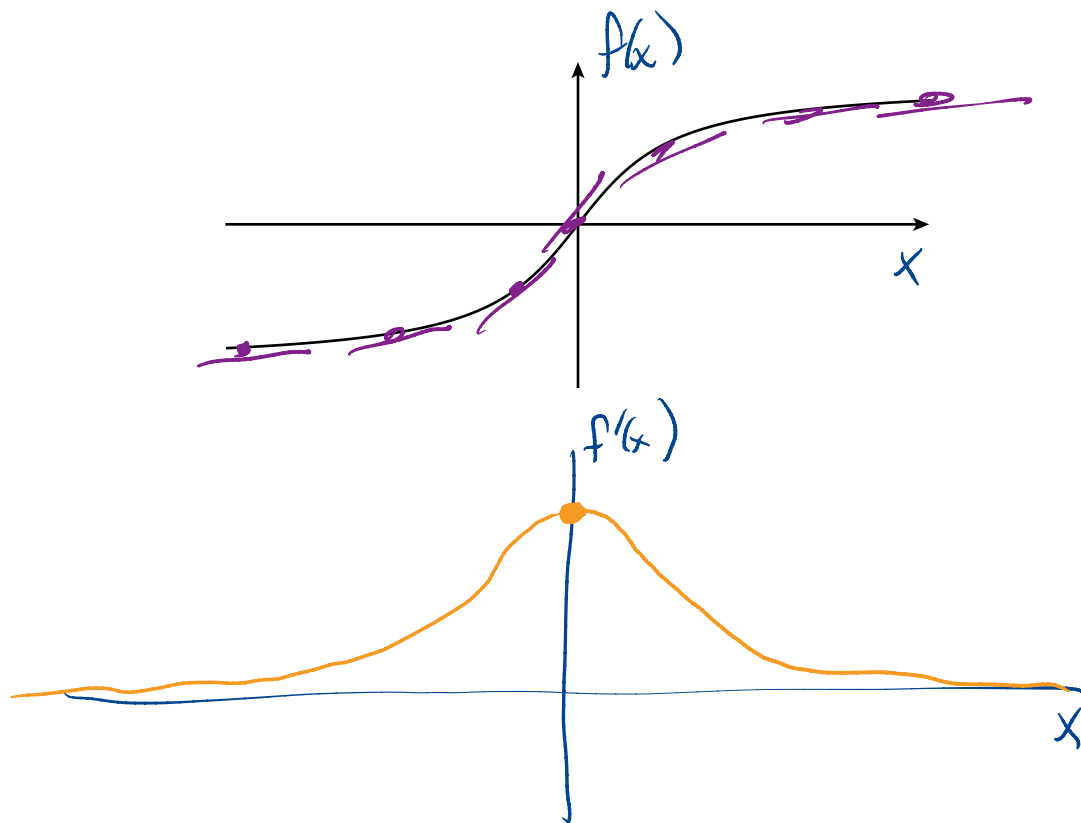
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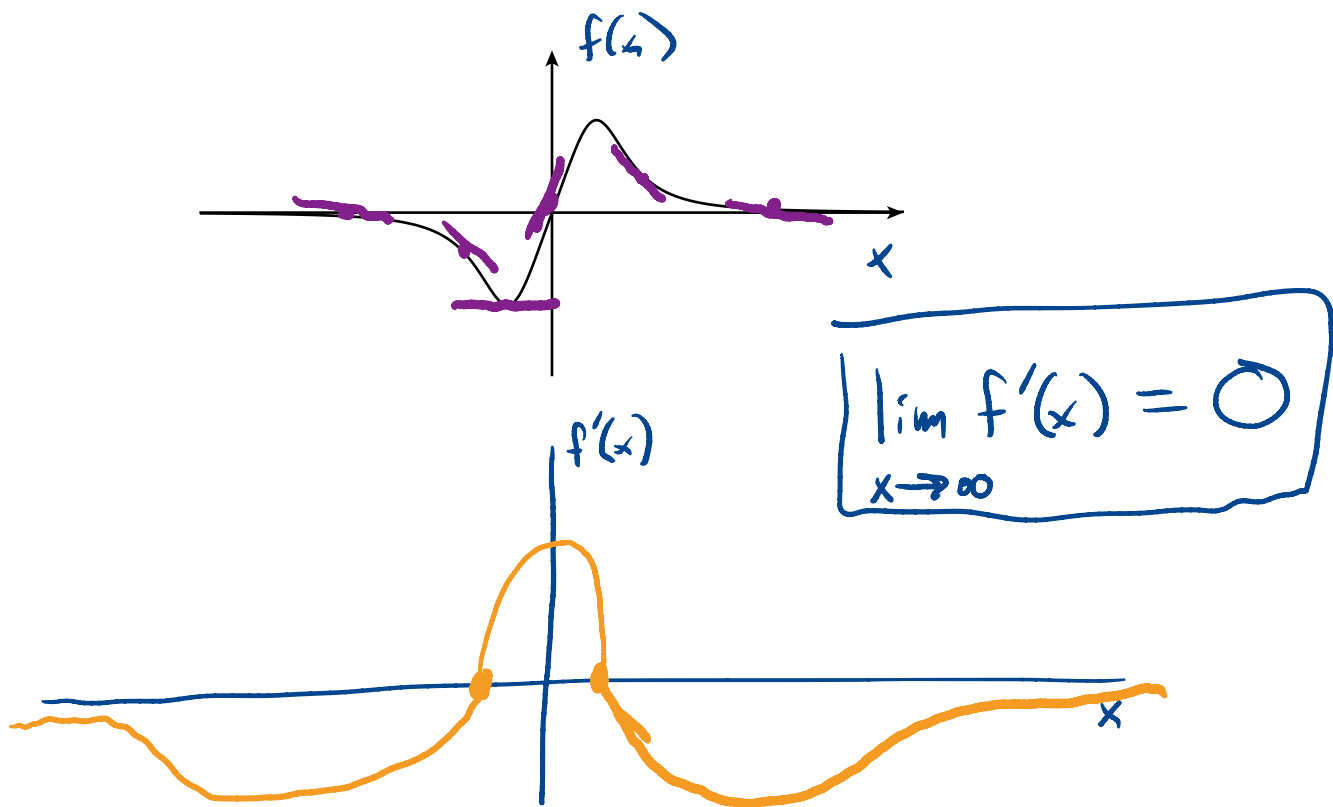
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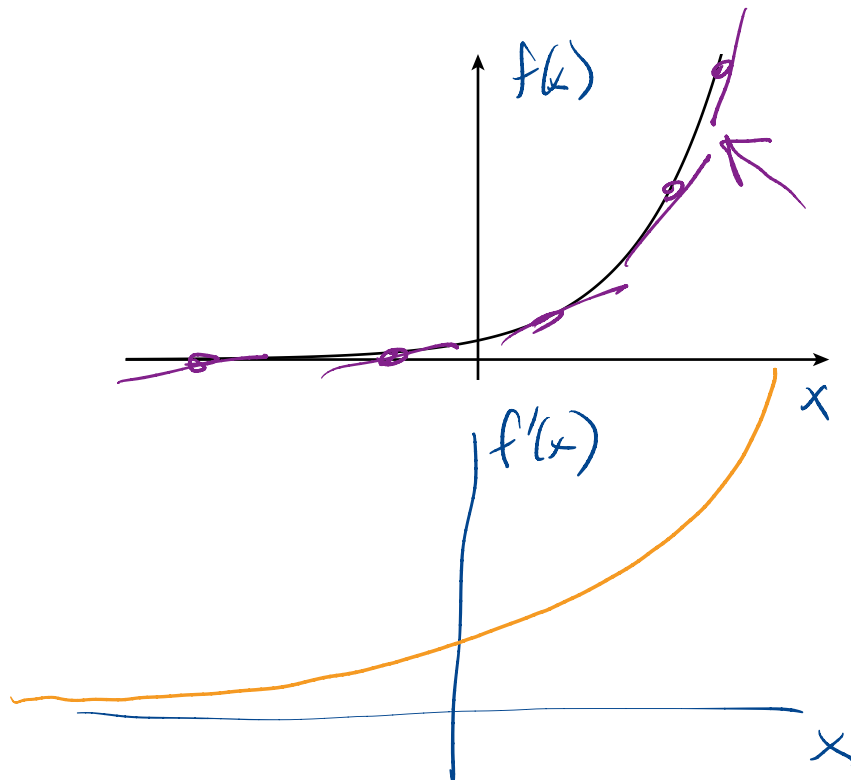
5.



6.



7.



8.

