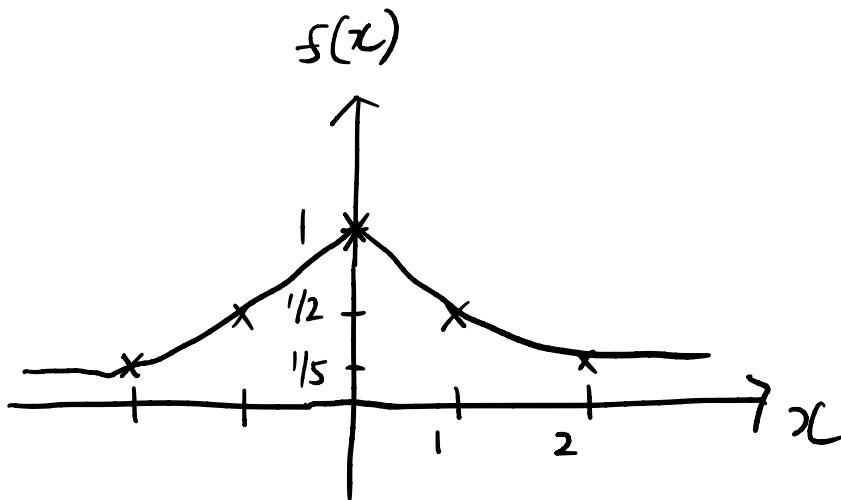
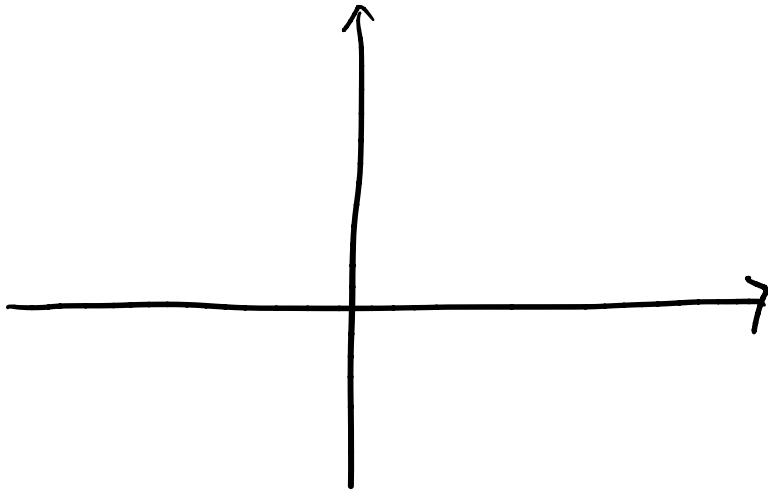


Let $f(x) = \frac{1}{1+x^2}$. Graph

$y = f(x)$ and compute $f'(x)$.



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$$f'(x) = \lim_{\Delta x \rightarrow 0} \frac{\frac{1}{1+(x+\Delta x)^2} - \frac{1}{1+x^2}}{\Delta x}$$

$$= \lim_{\Delta x \rightarrow 0} \frac{1}{\Delta x} \left(\frac{1+x^2 - (1+x^2+2x\Delta x+\Delta x^2)}{1+x^2+x^4+2x\Delta x+2x^3\Delta x+\Delta x^2+x^2\Delta x^2} \right)$$

$$= \lim_{\Delta x \rightarrow 0} \frac{1}{\Delta x} \left(\frac{-\cancel{\Delta x}(2x+\Delta x)}{x^4+2x^3\Delta x+2x^2+\cancel{x^2\Delta x^2}+2x\Delta x+\Delta x^2+1} \right)$$

$$= \frac{-2x}{x^4 + 2x^2 + 1}$$

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