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$$egin{aligned} &rac{d}{dx}(x^2) \ &= \lim_{\Delta x o 0} rac{(x+\Delta x)^2 - x^2}{\Delta x} \ &= \lim_{\Delta x o 0} rac{x^2 + 2x\Delta x + (\Delta x)^2 - x^2}{\Delta x} \ &= \lim_{\Delta x o 0} rac{2x\Delta x + (\Delta x)^2}{\Delta x} \ &= \lim_{\Delta x o 0} (2x + \Delta x) \end{aligned}$$

=2x