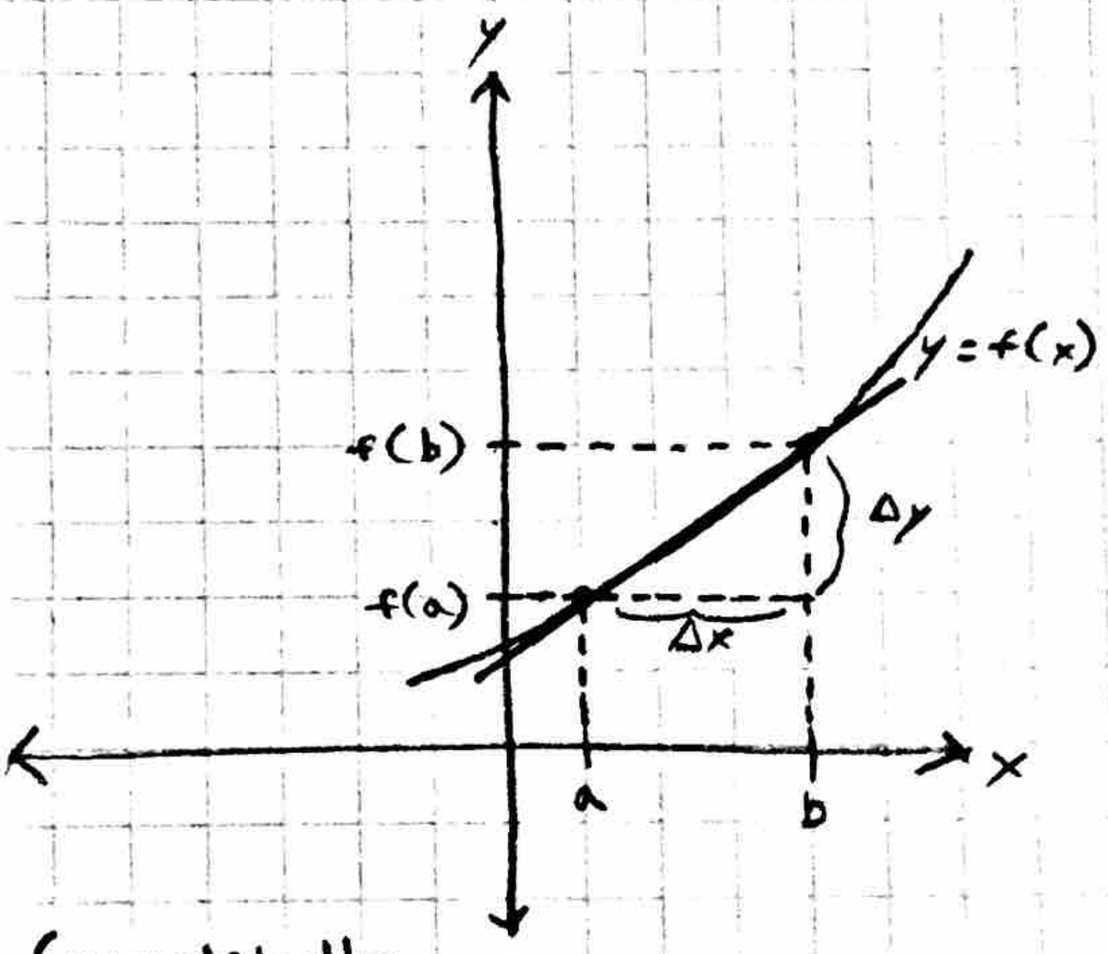
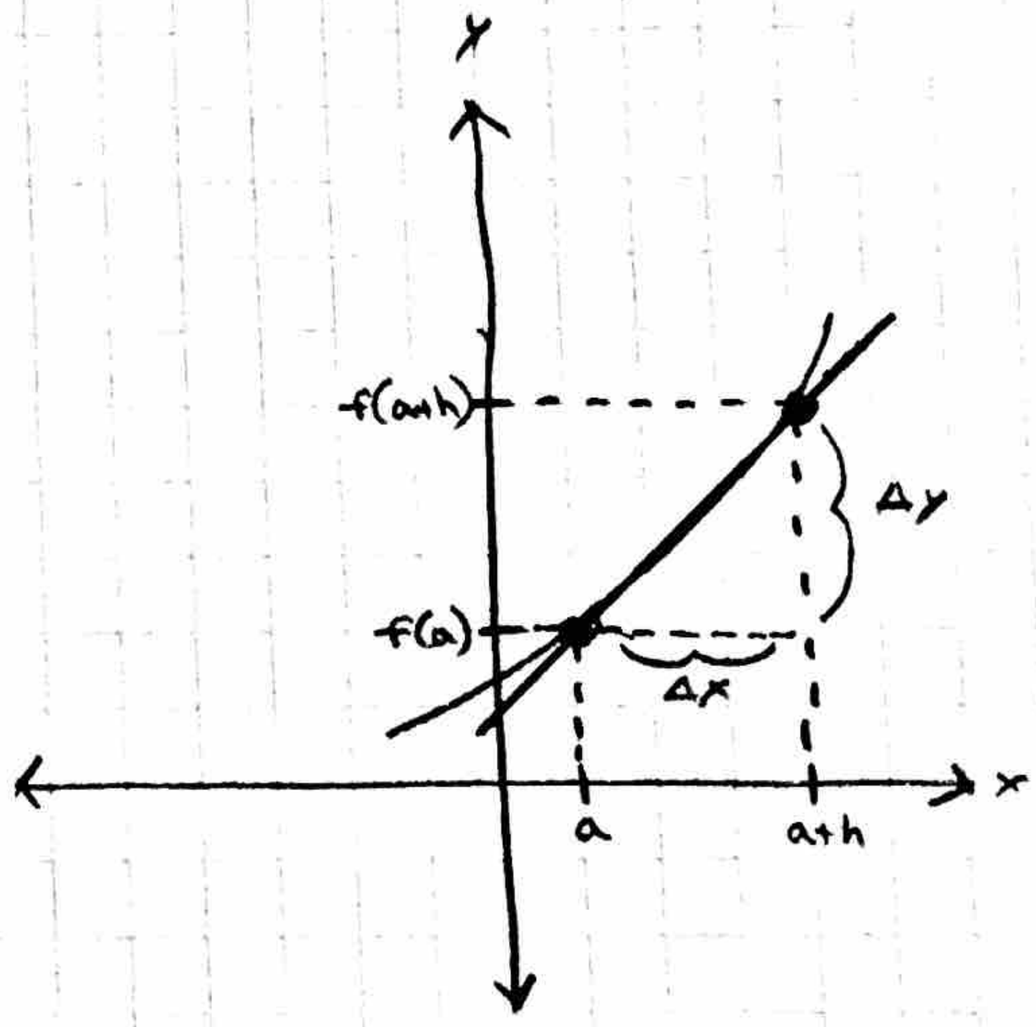
Difference Quotients

The average rate of change of $y = f(x)$ with respect to x over the interval $[a,b]$ is given by:

$$\frac{\Delta y}{\Delta x} = \frac{f(b)-f(a)}{b-a} = \frac{f(a+h)-f(a)}{h}$$

where $b = a+h$ and $h > 0$





Geometrically,
The rate of change of f over $[a,b]$ is the slope of the secant line through the points $(a, f(a))$ and $(b, f(b))$

Average speed is an average rate of change over a function that describes the distance traveled by a moving object.