Math 16A
Kouba
Derive the Derivative of a Line Using the Limit definition of the Derivative

Let $f(x) = mx + b$. It's derivative is

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$$= \lim_{h \to 0} \frac{(m(x+h)+b) - (mx+b)}{h}$$

$$= \lim_{h \to 0} \frac{mx + mh + b - mx - b}{h}$$

$$= \lim_{h \to 0} \frac{mh}{h}$$

$$= \lim_{h \to 0} m$$

$$= m \ ,$$

i.e.,

$$D\{mx + b\} = m$$