

$$\frac{d}{dt} \int_{u(t)}^{v(t)} f(x, t) dx = f(v(t), t) \frac{dv}{dt} - f(u(t), t) \frac{du}{dt} + \int_{u(t)}^{v(t)} \frac{\partial}{\partial t} f(x, t) dx$$

$$\frac{df(x)}{dx} = \lim_{\Delta x \rightarrow 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$$

Given  $y = f(x)$ ,  $\frac{df^{-1}(y)}{dy} = \frac{dx}{df(x)}$