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

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

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