Newton's Law-o-cooling

$$\text{Rate} = -k(T_L - T_A)$$

$$\frac{\Delta T_L}{\Delta t} = -k(T_L - T_A)$$

$\int F(x)\,dx$

derivative

$$\boxed{\frac{dT_L}{dt}} = -k(T_L - T_A)$$

Ex: $F = ma$

$\rightarrow \frac{m}{s^2} = \frac{\Delta v}{\Delta t} = \frac{dv}{dt}$

$F = m\frac{dv}{dt}$

Ex: interest

rate-of-change $\frac{dV}{dt} = rV$ ← value, r → rate (20.5%)

$dV = rV\,dt$

$\frac{dV}{V} = r\,dt$

$$\frac{dV}{V} = r\,dt$$

$$\int \frac{1}{V}\,dV = \int r\,dt$$

$$\ln(V) + D = rt + C$$

$\log_{10} 100 = 2$

$$\ln(V) = rt + (C - D) \to a$$

$$\ln(V) = rt + a$$

$$e^{[\ln(V)]} = e^{[rt + a]}$$

$$V = e^{[rt + a]}$$

$$V = e^{rt} + e^{a} \quad a \to B$$

$$V = e^{rt} + B$$