NAME: AKA PEACE OTAOGHENE
MATRIC NO: 18/ENG01/002
DEPARTMENT: CHEMICAL ENGINEERING

1. A dynamic equation can be reffered to as a difference equation in discrete time ~~differential~~ equation in Continous time and time scale calculus in ~~Conti~~ Combined discrete and Continous time.

2. $y = Atc^t_t$ --①

$y = Ae^t$

$y = Ate^t$

$u = At \quad v = e^t$

$\frac{du}{dt} = A \quad \frac{dv}{dt} = e^t$

$\frac{dy}{dt} = v\frac{du}{dt} + u\frac{dv}{dt}$

$\frac{dy}{dt} = e^t A + Ate^t$

$\frac{dy}{dt} = Ae^t + Ate^t$

$\frac{dy}{dt} = A(e^t + te^t)$ --③

$y = Ate^t$

$A = \frac{y}{Ate^t}$ ---②

Input eqn 2 in 3.

$\frac{dy}{dt} = \frac{y}{Ate^t}(e^t + te^t)$

$\frac{dy}{dt} = y\left(\frac{1}{t} + 1\right) \quad \frac{dy}{dt} = y\left(1 + \frac{1}{t}\right)$