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MECHANICAL

ENG 282

1. Dynamic Equation in Mathematics refers to the difference equation in discrete time, differential equation in continuous time, time scale Calculus in combined discrete and continuous time.

② $y = Ate^t$... (i) Where A is a constant

$$\frac{dy}{dt} = A + \frac{d}{dt}(e^t) + e^t \frac{d}{dt}(At)$$

$$\frac{dy}{dt} = Ate^t + Ae^t \dots (ii)$$

from equ (i), make Ae^t the subject

$$y = Ate^t$$

$$\frac{y}{t} = Ae^t \dots (iii)$$

Put equation (i) and (iii) in equ (ii)

$$\frac{dy}{dt} = y + \frac{y}{t}$$

multiply through by t

$$t \frac{dy}{dt} = ty + y = (t+1)y$$

$$t \frac{dy}{dt} - (t+1)y = 0$$

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

$$t \frac{dy}{dx} = y(t+1)$$

$$\frac{dy}{dx} = \frac{y}{t} [t+1]$$