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a Define a dynamic equation

This refers to a differential equation in continous time. It is an equation that depicts changes in a variable or function with repeat to a time scale.

b An engineering system is described by the equation I. Develop a dynamic model in form a an ordinary differential equation for the system.

Equation I: $y = Ate^t$

Solu

$$y = Ate^t$$

$$y = y/te^t$$

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

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

$$\frac{dy}{dt} = \left(\frac{y}{te^t}\right)dt + y$$

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

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