1. \[ \frac{d^2y}{dx^2} = A\sin x \quad \frac{dy}{dx} + B \cos x \Rightarrow \begin{cases} \frac{dw}{dx} = uA \sin x + B \cos x \\ w = \frac{dy}{dx} \end{cases} \]

Need \( x(0), v(0) \) or something equivalent

2. 1) Natural motion (no force) is straight-line motion at constant speed
2) \( F = \frac{dp}{dt} \) Force is defined as the rate of momentum change
3) Forces are binary and come in action-reaction pairs.

→ Doesn’t hold for Lorentz force \( F = qv \times \mathbf{B} \) and does not hold instant by instant when forces take a finite time to propagate.
3. Ladder - one example

1) \( \Sigma T = 0 \) - torques, take moment around cm
2) \( \Sigma F_x = 0 \)
3) \( \Sigma F_y = 0 \)
4) \( x \) is related to \( a_x \) and \( a_x \) is related to \( y \).

(Don't need a question)