

$$(2) \quad \frac{d}{dt} \left[\frac{\partial L}{\partial \dot{x}_1} \right] - \frac{\partial L}{\partial x_1} = F(t) = u$$

$$\frac{d}{dt} [(M+m) \dot{x}_1 + m l \dot{x}_2 \cos x_1] = u$$

$$(M+m) \ddot{x}_1 + (m l \cos x_1) \ddot{x}_2 - (m l x_2 \sin x_1) \dot{x}_1 = u$$

$$(M+m) \ddot{x}_1 + (m l \cos x_1) \ddot{x}_2 = u + m l x_2 \sin x_1$$

--- (B)

Dengan (A) dan (B), dapat dicari

$$\dot{x}_2 = f(x, u, t) = \dots$$

$$\dot{x}_1 = g(x, u, t) = \dots$$

$$\text{dari A} = \dot{x}_2 = \frac{g \sin x_1 - \dot{x}_1 \cos x_1}{l} \rightarrow (B)$$