

$$1a) T = \frac{1}{2} (m_1 (\dot{x}_1^2 + \dot{y}_1^2) + m_2 (\dot{x}_2^2 + \dot{y}_2^2)) /$$

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$$= \frac{1}{2} (m_1 \dot{x}_1^2 + m_2 (\dot{x}_2^2 + \dot{y}_2^2)) \quad \checkmark$$

$$V = g(m_1 y_1 + m_2 y_2)$$

$$= 0$$

$$- g m_2 y_2 \quad \checkmark$$

$$L = T - V = \frac{1}{2} (m_1 \dot{x}^2 + m_2 (\dot{x}_2^2 + \dot{y}_2^2)) - m_2 y_2 g \quad \checkmark$$

$$| x_1 = x$$

$$b) y_1 = 0$$

$$x_2 = x + l \sin \varphi$$

$$y_2 = -l \cos \varphi$$

$$\underline{q_1 = x, q_2 = \varphi} \quad ?$$