Project 02 Formulas

First of all to compute shift in coordinates use. $S = v_0 t + \frac{at^2}{2}$.

Formula for accels

acc$_1$.

$$m_1 a_1 = -m_3 a_1 - \mu_2 a_2 + \mu_2 m_2 g - \mu_1 (m_2 a_2 + \mu_2 g)$$

$$a_1 (m_1 + m_3) = -\mu_2 a_2 + \mu_2 m_2 \cdot g - \mu_1 m_1 g + \mu \cdot m_2 \cdot a_2 + \mu_1 \mu_2 g.$$

$$a_1 = \frac{(-\mu_2 a_2 + \mu_2 m_2 \cdot g - \mu_1 m_1 g - \mu_1 m_1 g + \mu_1 m_2 a_2 + \mu_1 \mu_2 \cdot m_2 g)}{(m_1 + m_2)}$$

also know that

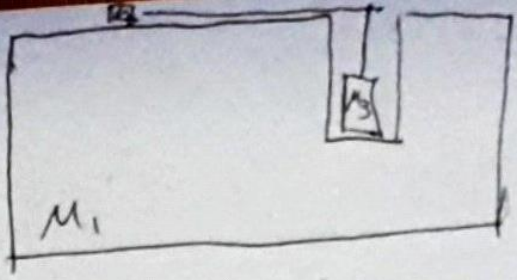
$a_2 = a_3$.

$$m_2 a_2 + \mu_2 \cdot m_2 \cdot g - m_3 g + 2\mu_3 F = m_3 ((-\mu_2 a_2 + \mu_2 a_2 + \mu_2 \cdot m_2 g - \mu_1 m_1 g + \mu_1 m_2 a_2 + \mu_1 \mu_2 m_2 g - m_1 \cdot a_2 \cdot m_3 \cdot a_2)$$

$$m_3 (-\mu_2 a_2 + \mu_2 \cdot m_2 \cdot g - m_1 \cdot m_1 \cdot g + m_1 \cdot m_2 \cdot a_2 + \mu_1 \mu_2 \cdot m_2 g - m_1 a_2 - m_3 a_2) = (m_1 + m_3)(m_2 \cdot a_2 + \mu_2 m_2 g - m_3 g + 2\mu_3 \cdot F$$

$$a_2 = \frac{(1 - m_1 + m_3)(\mu_2 m_2 \cdot g - m_3 \cdot g + 2\mu_3 \cdot F) + m_3 (\mu_2 m_2 g - \mu_1 m_1 g + \mu_1 \mu_2 m_2 g)}{m_2 (m_1 + m_3) - m_3 (-m_2 + \mu_1 \mu_2 - m_1 - m_3)}$$

rce Diagram.



F_{f_1}
F_{f_2} frict.
F_{f_3}

Invert axis for bottom one