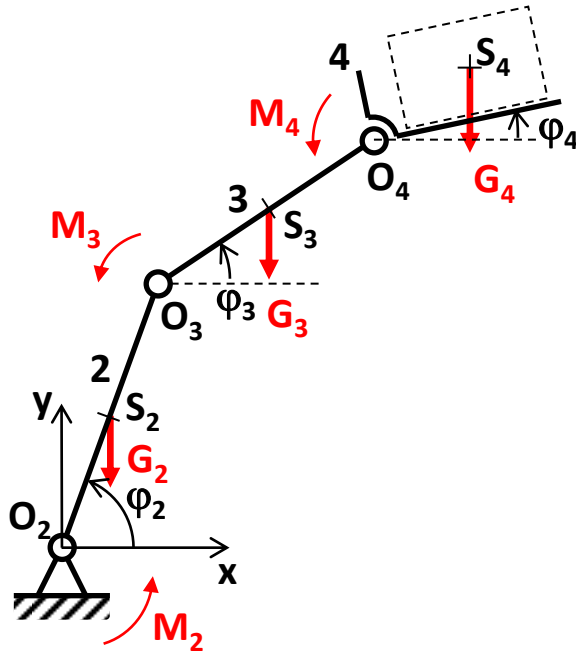


## Example 2A:

Solve the problem of manipulator inverse dynamics using Lagrange's equations of mixed type.



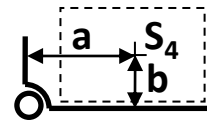
Known parameters:

$$m_2, m_3, m_4, l_{2S_2}, l_{3S_3}, l_{4S_4},$$

$$|O_2S_2| = |S_2O_3| = l_2,$$

$$|O_3S_3| = |S_3O_4| = l_3, a, b,$$

$$\varphi_2(t), \varphi_3(t), \varphi_4(t),$$



$$M_2(t) = ?$$

$$M_3(t) = ?$$

$$M_4(t) = ?$$

