Preliminary work

March 22, 2020

$$F_1 - f_1 - N_{0x} = M_1 a_1$$
$$T - f_2 = M_2 a_2$$
$$-F_1 = M_3 a_{3x}$$
$$2f_3 + T - M_3 g = M_3 a_{3y}$$
$$N_{0x} - T = M_0 a_0 = 0$$

Constraints(the derivation can be found in the solution of the quiz):

$$a_1 - a_2 - a_{3y} = 0$$

$$a_1 = a_{3x}$$

Let's note that

$$f_1 = \mu_1 N_1$$
$$f_2 = \mu_2 N_2$$
$$f_3 = \mu_3 F_1$$

are forces emerged because of friction.

From the system of equations above, we can find $F_1(t)$ and $x_1(t)$, $x_2(t)$, $y_3(t)$. Having the mentioned functions. We will be able to calculate their values at a given time t.