

Problem I.2.1

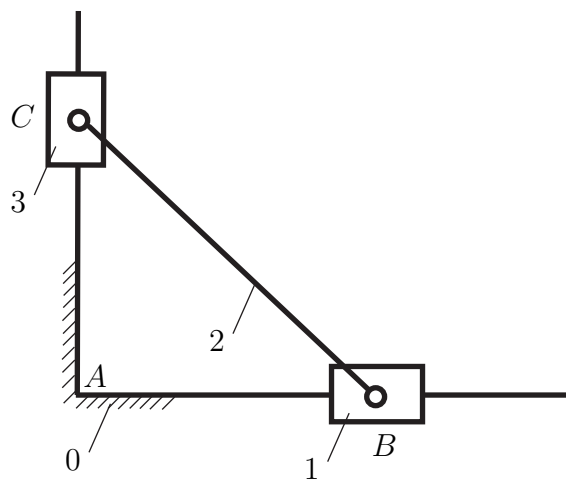


Figure PI.2.1

$$n = 3$$

$$c_5 = 4: B_T(0, 1), B_R(1, 2), C_R(2, 3), C_T(3, 0)$$

$$M = 3n - 2c_5 - c_4 = 3(3) - 2(4) = 1$$

Problem I.2.2

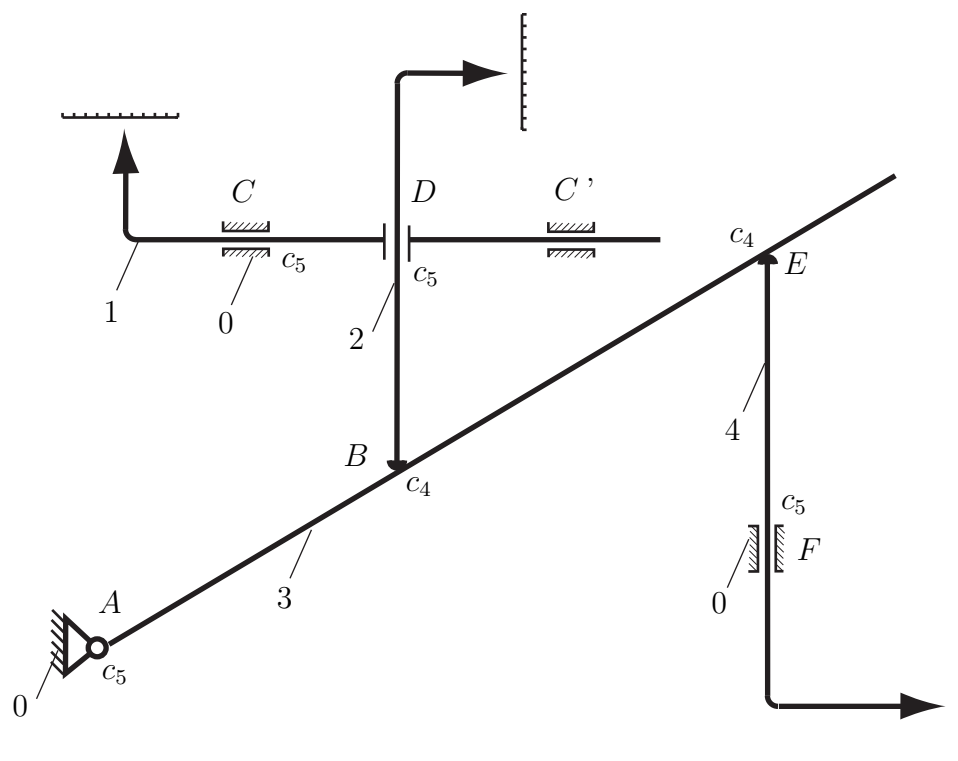


Figure PI.2.2

$$n = 4$$

$$c_5 = 4: C_T(0, 1), D_T(1, 2), A_R(3, 0), F_T(4, 0)$$

$$c_4 = 2: B(2, 3), E(3, 4)$$

$$M = 3n - 2c_5 - c_4 = 3(4) - 2(4) - 2 = 2$$

Problem I.2.3

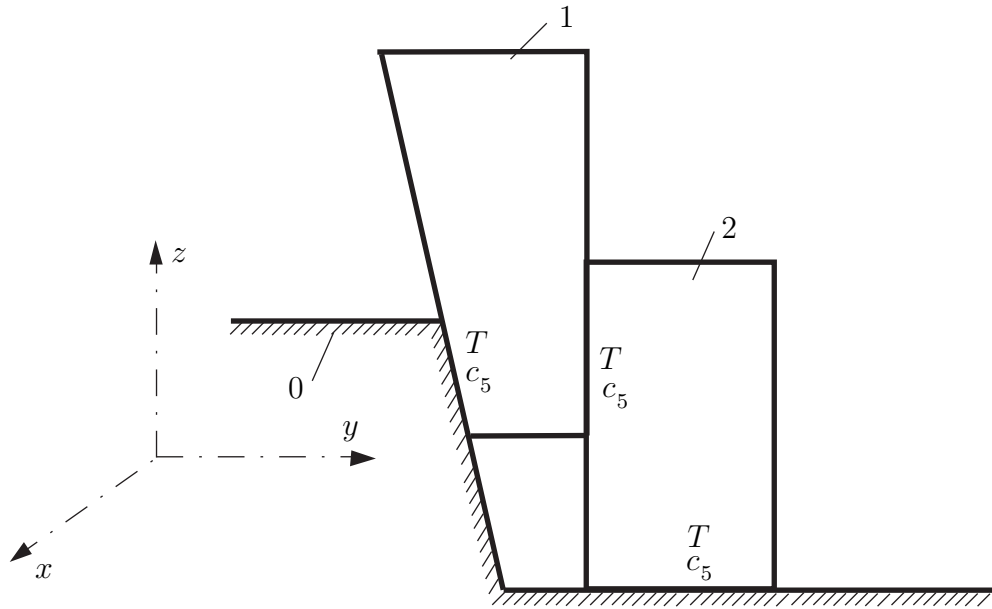


Figure PI.2.3

Mobility table

Link	T_x	T_y	T_z	R_x	R_y	R_z
0	No	No	No	No	No	No
1	No	No	Yes	No	No	No
2	No	Yes	No	No	No	No
	No			No	No	No

for all links $T_x=\text{No} \ \& \ R_x=\text{No} \ \& \ R_y=\text{No} \ \& \ R_z=\text{No} \ \implies \ f=4$

There are three translational joints of class 5 ($c_5 = 3$) in the system:

- there is one translational joint between link 0 and link 1;
- there is one translational joint between link 1 and link 2;
- there is one translational joint between link 2 and link 0.

The number of DOF for this mechanism with two moving links ($n = 2$) is given by

$$M = 2n - c_5 = 2(2) - (3) = 1$$