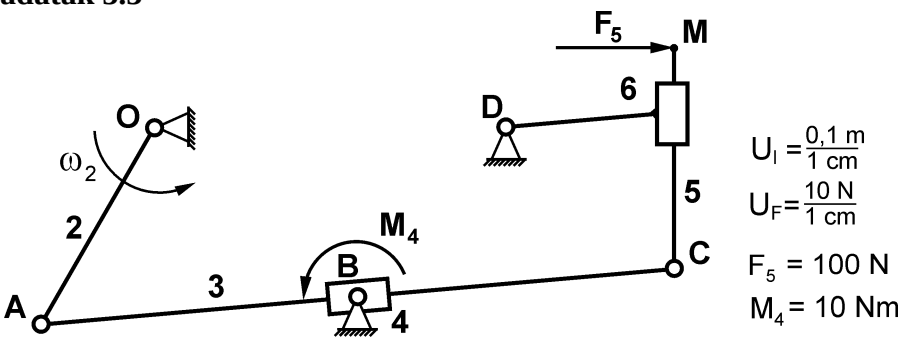
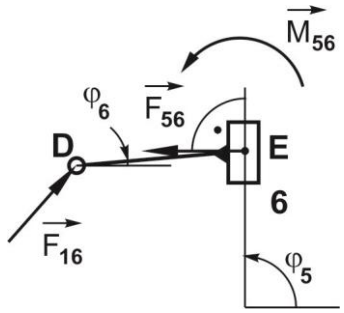
Zadatak 3.3



Član 6



$\vec{F}_{56} = F_{56}\cos(\varphi_5 + \pi/2)\vec{i} + F_{56}\sin(\varphi_5 + \pi/2)\vec{j}$

$\vec{M}_{56} = M_{56}\vec{k}$

$\vec{F}_{16} = F_{16x}\vec{i} + F_{16y}\vec{j}$

$\sum \vec{F}_i(6) = \vec{F}_{16} + \vec{F}_{56} = 0$

$\sum \vec{M}_D(6) = \vec{M}_{56} + \overrightarrow{DE} \times \vec{F}_{56} = 0$

$F_{16x} + F_{56}\cos(\varphi_5 + \pi/2) = 0$ 1.

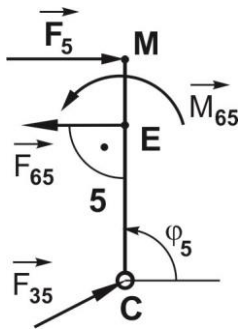
$F_{16y} + F_{56}\sin(\varphi_5 + \pi/2) = 0$ 2.

$M_{56} + DE_x \cdot F_{56}\sin(\varphi_5 + \pi/2) - DE_y \cdot F_{56}\cos(\varphi_5 + \pi/2) = 0$ 3.

$DE_x = DE\cos\varphi_6$

$DE_y = DE\sin\varphi_6$

Član 5



$\vec{F}_{65} = -\vec{F}_{56} = -F_{56}\cos(\varphi_5 + \pi/2)\vec{i} - F_{56}\sin(\varphi_5 + \pi/2)\vec{j}$

$\vec{M}_{65} = -\vec{M}_{56} = -M_{56}\vec{k}$

$\vec{F}_{35} = F_{35x}\vec{i} + F_{35y}\vec{j}$

$\sum \vec{F}_i(5) = \vec{F}_{65} + \vec{F}_{35} + \vec{F}_5 = 0$

$\sum \vec{M}_C(5) = \vec{M}_{65} + \overrightarrow{CE} \times \vec{F}_{65} + \overrightarrow{CM} \times \vec{F}_5 = 0$

$\sum \vec{F}_i(5) = \left(-\vec{F}_{56}\right) + \vec{F}_{35} + \vec{F}_5 = 0$

$\sum \vec{M}_C(5) = \left(-\vec{M}_{56}\right) + \overrightarrow{CE} \times \left(-\vec{F}_{56}\right) + \overrightarrow{CM} \times \vec{F}_5 = 0$

$F_{35x} - F_{56}\cos(\varphi_5 + \pi/2) + 100 = 0$ 4.

$F_{35y} - F_{56}\sin(\varphi_5 + \pi/2) + 0 = 0$ 5.

$-M_{56} + CE_x \cdot \left(-F_{56}\sin(\varphi_5 + \pi/2)\right) - CE_y \cdot \left(-F_{56}\cos(\varphi_5 + \pi/2)\right) + CM_x \cdot 0 - CM_y \cdot 100 = 0$ 6.

$CE_x = CE\cos\varphi_5$

$CE_y = CE\sin\varphi_5$

$CM_x = CM\cos\varphi_5$

$CM_y = CM\sin\varphi_5$

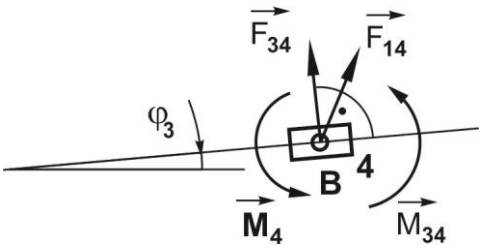
Iz jednačina 1. do 6. računaju se: $F_{56}, M_{56}, F_{16x}, F_{16y}, F_{35x}, F_{35y}$

Član 4

$\vec{F}_{34} = F_{34}\cos(\varphi_3 + \pi/2)\vec{i} + F_{34}\sin(\varphi_3 + \pi/2)\vec{j}$

$\vec{M}_{34} = M_{34}\vec{k}$

$\vec{F}_{14} = F_{14x}\vec{i} + F_{14y}\vec{j}$



$\sum \vec{F}_i(4) = \vec{F}_{14} + \vec{F}_{34} = 0$

$\sum \vec{M}_B(4) = \vec{M}_4 + \vec{M}_{34} = 0$

$F_{14x} + F_{14}\cos(\varphi_3 + \pi/2) = 0$ 1.

$F_{14y} + F_{14}\sin(\varphi_3 + \pi/2) = 0$ 2.

$M_{34} + 10 = 0$ 3.

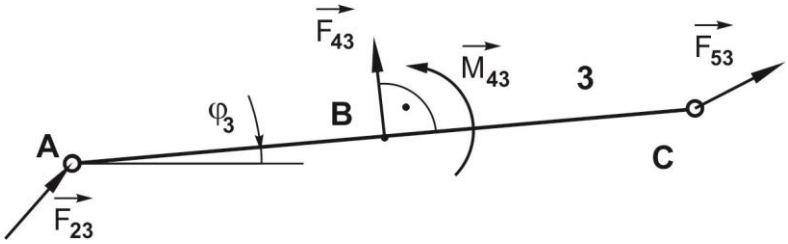
Član 3

$\vec{F}_{43} = -\vec{F}_{34} = -F_{34}\cos(\varphi_3 + \pi/2)\vec{i} - F_{34}\sin(\varphi_3 + \pi/2)\vec{j}$

$\vec{M}_{43} = -\vec{M}_{34} = -M_{34}\vec{k}$

$\vec{F}_{53} = -\vec{F}_{35} = -F_{35x}\vec{i} - F_{35y}\vec{j}$

$\vec{F}_{23} = F_{23x}\vec{i} + F_{23y}\vec{j}$



$\sum \vec{F}_i(3) = \vec{F}_{23} + \vec{F}_{43} + \vec{F}_{53} = 0$

$\sum \vec{M}_A(3) = \vec{M}_{43} + \overrightarrow{AB} \times \vec{F}_{43} + \overrightarrow{AC} \times \vec{F}_{53} = 0$

$\sum \vec{F}_i(3) = \vec{F}_{23} + \left(-\vec{F}_{34}\right) + \left(-\vec{F}_{35}\right) = 0$

$\sum \vec{M}_A(3) = \left(-\vec{M}_{34}\right) + \overrightarrow{AB} \times \left(-\vec{F}_{34}\right) + \overrightarrow{AC} \times \left(-\vec{F}_{35}\right) = 0$

$F_{23x} - F_{34}\cos(\varphi_3 + \pi/2) - F_{35x} = 0$ 4.

$F_{23y} - F_{34}\sin(\varphi_3 + \pi/2) - F_{35y} = 0$ 5.

$-M_{34} + AB_x \cdot \left(-F_{34}\sin(\varphi_3 + \pi/2)\right) - AB_y \cdot \left(-F_{34}\cos(\varphi_3 + \pi/2)\right) + AC_x \cdot \left(-F_{35x}\right) - AC_y \cdot \left(-F_{35y}\right) = 0$ 6.

$AB_x = AB\cos\varphi_3 \quad AC_x = AC\cos\varphi_3$

$AB_y = AB\sin\varphi_3 \quad AC_y = AC\sin\varphi_3$

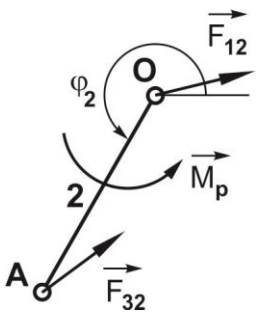
Iz jednačina 1. do 6. računaju se: $F_{34}, M_{34}, F_{14x}, F_{14y}, F_{23x}, F_{23y}$

Član 2

$\vec{F}_{32} = -\vec{F}_{23} = -F_{23x}\vec{i} - F_{23y}\vec{j}$

$\vec{F}_{12} = F_{12x}\vec{i} + F_{12y}\vec{j}$

$\vec{M}_p = M_p\vec{k}$



$$\sum \vec{F}_i(2) = \vec{F}_{32} + \vec{F}_{12} = 0$$

$$\sum \vec{M}_O(2) = \vec{M}_p + \overrightarrow{OA} \times \vec{F}_{32} = 0$$

$$\sum \vec{F}_i(2) = \left(-\vec{F}_{23}\right) + \vec{F}_{12} = 0$$

$$\sum \vec{M}_0(2) = \vec{M}_p + \overrightarrow{OA} \times \left(-\vec{F}_{23}\right) = 0$$

$F_{12x} - F_{23x} = 0$ 1.

$F_{12y} - F_{23y} = 0$ 2.

$M_p + OA_x \cdot \left(-F_{23y}\right) - OA_y \cdot \left(-F_{23x}\right) = 0$ 3.

$OA_x = OA\cos\varphi_2$

$OA_y = OA\sin\varphi_2$

Iz jednačina 1. do 3. računaju se: M_p, F_{12x}, F_{12y}