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/2,3,4/.

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1,

OABCD

$$f_1 = l_1 \cos \varphi_1 + l_{AB} \cos(\varphi_2 - \alpha_2) + l_3 \cos \varphi_3 + l_4 \cos \varphi_4 - l_0 = 0, \quad (1)$$

$$f_2 = l_1 \sin \varphi_1 + l_{AB} \sin(\varphi_2 - \alpha_2) + l_3 \sin \varphi_3 + l_4 \sin \varphi_4 = 0,$$

DCLKMD

$$f_3 = -l_4 \cos \varphi_4 - l_{CL} \cos(\varphi_3 - \beta_3) - l_{LK} \cos(\varphi_6 - \beta_6) + l_7 \cos \varphi_7 - l_{DM} \cos \alpha_0 = 0, \quad (2)$$

$$f_4 = -l_4 \sin \varphi_4 - l_{CL} \sin(\varphi_3 - \beta_3) - l_{LK} \sin(\varphi_6 - \beta_6) + l_7 \sin \varphi_7 - l_{DM} \sin \alpha_0 = 0,$$

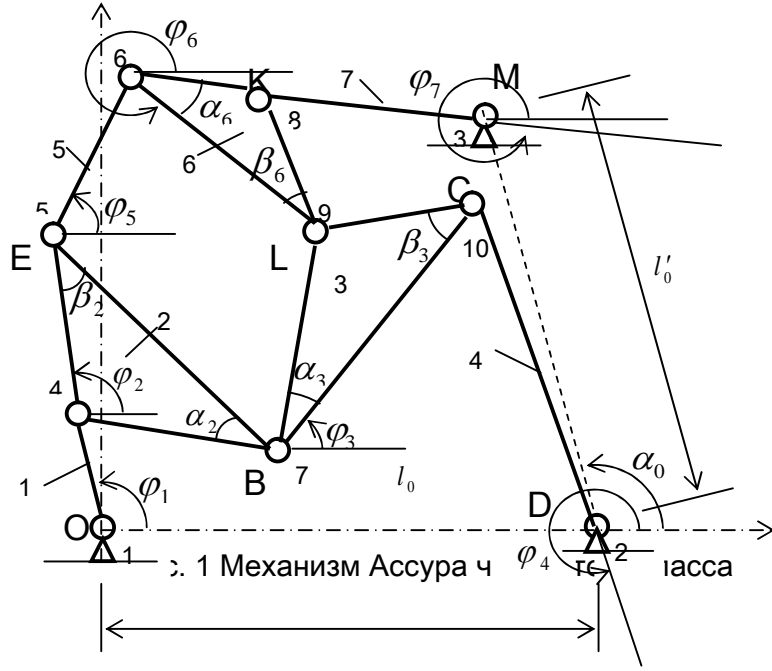
BEFLB

$$f_5 = l_5 \cos \varphi_5 + l_{BE} \cos(\varphi_2 - \beta_2) + l_6 \cos \varphi_6 + l_{BL} \cos(\varphi_3 - \alpha_3) = 0, \quad (3)$$

$$f_6 = l_5 \sin \varphi_5 + l_{BE} \sin(\varphi_2 - \beta_2) + l_6 \sin \varphi_6 + l_{BL} \sin(\varphi_3 - \alpha_3) = 0,$$

(1)-(3)

$\varphi_i, i = 2, 3, 4, 5, 6, 7$



$$(3) \quad \cos \varphi_5 \cdot f_j + \sin \varphi_5 \cdot f_{j+1} = 0, \quad -\sin \varphi_5 \cdot f_j + \cos \varphi_5 \cdot f_{j+1} = 0, \quad (1)-$$

$$\cos \varphi_5 \cdot f_j + \sin \varphi_5 \cdot f_{j+1} = 0, \quad (4)$$

$$-\sin \varphi_5 \cdot f_j + \cos \varphi_5 \cdot f_{j+1} = 0, \quad j = 1, 3, 5.$$

(2)

$$f_3 = -l_4 \cos \varphi_4 - l_{CL} \cos(\varphi_3 - \beta_3) - l_{LK} \cos(\varphi_6 - \beta_6) + l_\gamma \cos \varphi_\gamma = 0, \quad (5)$$

$$f_4 = -l_4 \sin \varphi_4 - l_{CL} \sin(\varphi_3 - \beta_3) - l_{LK} \sin(\varphi_6 - \beta_6) + l_\gamma \sin \varphi_\gamma = 0,$$

$$l_\gamma = \sqrt{(l_7 \cos \varphi_7 - l_{DM} \cos \alpha_0)^2 + (l_7 \sin \varphi_7 - l_{DM} \sin \alpha_0)^2}, \quad (6)$$

$$\operatorname{tg} \gamma = \frac{l_7 \sin \varphi_7 - l_{DM} \sin \alpha_0}{l_7 \cos \varphi_7 - l_{DM} \cos \alpha_0},$$

$$l_7 \cos \varphi_7 \neq l_{DM} \cos \alpha_0.$$

$$(4) \quad j = 5, \dots$$

$$l_5 + l_{BE} \cos(\varphi_{25} - \beta_2) + l_6 \cos \varphi_{65} + l_{BL} \cos(\varphi_{35} - \alpha_3) = 0, \quad (7)$$

$$l_{BE} \sin(\varphi_{25} - \beta_2) + l_6 \sin \varphi_{65} + l_{BL} \sin(\varphi_{35} - \alpha_3) = 0,$$

$$\varphi_{i5} = \varphi_i - \varphi_5, \quad i = 2, 3, 6 -$$

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$\varphi_{65}$ ,

(7)

$$\varphi_{25} \quad \varphi_{35} \quad :$$

$$\varphi_{35}^{(1,2)} = \pm \arccos \frac{-l_{BL}^2 - L_3^2 + l_{BE}^2}{2l_{BL}L_3} - \alpha_3 + \gamma_3, \quad (8)$$

$$\varphi_{25}^{(1,2)} = \pm \arccos \frac{-l_{BE}^2 - L_3^2 + l_{BL}^2}{2l_{BE}L_3} - \beta_2 + \gamma_3. \quad (9)$$

$$L_3 = \sqrt{(l_6 \cos \varphi_{65} - l_5)^2 + l_6^2 \sin^2 \varphi_{65}},$$

$$\gamma_3 = \arctg \frac{l_6 \sin \varphi_{65}}{l_6'' \cos \varphi_{65} + l_5}, \quad (10)$$

$$l_6 \cos \varphi_{65} \neq -l_5. \quad (4) \quad j = 3, \dots \quad (5)$$

$$-l_4 \cos \varphi_{45} - l_{CL} \cos(\varphi_{35} - \beta_3) - l_{LK} \cos(\varphi_{65} - \beta_6) + l_\gamma \cos \varphi_{\gamma 5} = 0, \quad (11)$$

$$-l_4 \sin \varphi_{45} - l_{CL} \sin(\varphi_{35} - \beta_3) - l_{LK} \sin(\varphi_{65} - \beta_6) + l_\gamma \sin \varphi_{\gamma 5} = 0,$$

$$\varphi_{45} = \varphi_4 - \varphi_5 \quad \varphi_{\gamma 5} = \gamma - \varphi_5. \quad :$$

$$\varphi_{45}^{(1,2)} = \pm \arccos \frac{l_4^2 + L_2^2 - l_\gamma'^2}{2l_4 L_2} + \gamma_2, \quad (12)$$

$$\varphi_{\gamma 5}^{(1,2)} = \pm \arccos \frac{l_\gamma'^2 + L_2^2 - l_4^2}{2l_\gamma L_2} + \gamma_2. \quad (13)$$

$$L_2 = \sqrt{(l_{CL} \cos(\varphi_{35} - \beta_3) + l_{LK} \cos(\varphi_{65} - \beta_6))^2 + (l_{CL} \sin(\varphi_{35} - \beta_3) + l_{LK} \sin(\varphi_{65} - \beta_6))^2},$$

$$\gamma_2 = \arctg \frac{l_{CL} \sin(\varphi_{35} - \beta_3) + l_{LK} \sin(\varphi_{65} - \beta_6)}{l_{CL} \cos(\varphi_{35} - \beta_3) + l_{LK} \cos(\varphi_{65} - \beta_6)}, \quad (14)$$

$$l_{CL} \cos(\varphi_{35} - \beta_3) \neq -l_{LK} \cos(\varphi_{65} - \beta_6). \quad (4) \quad j = 1, \dots$$

$$l_1 \cos \varphi_{15} + l_{AB} \cos(\varphi_{25} - \alpha_2) + l_3 \cos \varphi_{35} + l_4 \cos \varphi_{45} - l_0 \cos \varphi_5 = 0, \quad (15)$$

$$l_1 \sin \varphi_{15} + l_{AB} \sin(\varphi_{25} - \alpha_2) + l_3 \sin \varphi_{35} + l_4 \sin \varphi_{45} - l_0 \sin \varphi_5 = 0,$$

$$\varphi_{15} = \varphi_1 - \varphi_5 \quad \varphi_5. \quad :$$

$$\varphi_{15}^{(1,2)} = \pm \arccos \frac{l_1^2 + L_1^2 - l_0^2}{2l_1^2 L_1} + \gamma_1, \quad (16)$$

$$\varphi_5^{(1,2)} = \pm \arccos \frac{l_0^2 + L_1^2 - l_1^2}{2l_0 L_1} + \gamma_1. \quad (17)$$

$$L_1 = \sqrt{(-l_3 \cos \varphi_{35} - l_{AB} \cos(\varphi_{25} - \alpha_2) - l_4 \cos \varphi_{45})^2 + (-l_3 \sin \varphi_{35} - l_{AB} \sin(\varphi_{25} - \alpha_2) - l_4 \sin \varphi_4)^2},$$

$$\gamma_1 = \arctg \frac{l_3 \sin \varphi_{35} + l_{AB} \sin(\varphi_{25} - \alpha_2) + l_4 \sin \varphi_4}{l_3 \cos \varphi_{35} + l_{AB} \cos(\varphi_{25} - \alpha_2) + l_4 \cos \varphi_4},$$

$$l_3 \cos \varphi_{35} \neq -l_4 \cos \varphi_4 - l_{AB} \cos(\varphi_{25} - \alpha_2). \quad (18)$$

$$\varphi_5, \quad -$$

(5),

$$\varphi_i = \varphi_{i5} + \varphi_5, \quad (i = 1, 2, 3, 4, 6) \quad \gamma = \varphi_{\gamma 5} + \varphi_5. \quad \varphi_7$$

$$l_7 \cos \varphi_7 = l_{DM} \cos \alpha_0 + l_\gamma \cos \gamma, \quad (19)$$

$$l_7 \sin \varphi_7 = l_{DM} \sin \alpha_0 + l_\gamma \sin \gamma,$$

$$\varphi_7 = \arctg \frac{l_{DM} \sin \alpha_0 + l_\gamma \sin \gamma}{l_{DM} \cos \alpha_0 + l_\gamma \cos \gamma}, \quad (20)$$

$$l_{DM} \cos \alpha_0 \neq -l_\gamma \cos \gamma.$$

,  $\varphi_i$ ,  $i = 1, 2, 3, 4, 5, 6, 7$ ,