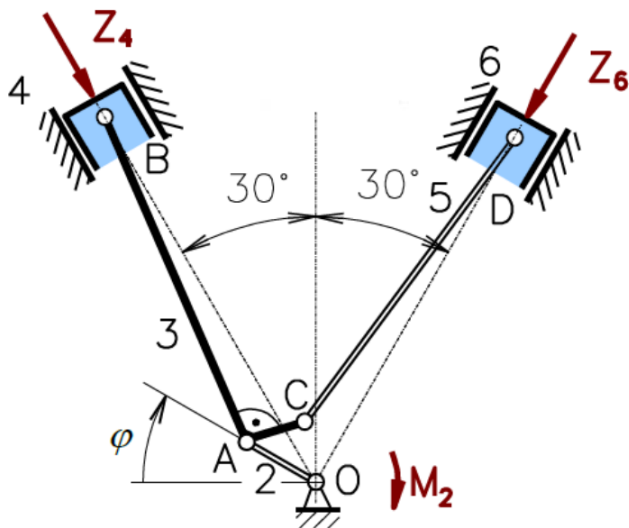


# Příklad 7.2



Na píst 4 spalovacího motoru s válci do V působí síla  $Z_4$  a na píst 6 působí síla  $Z_6$ . Určete silovou dvojici  $M_2$  působící na člen 2 pro rovnováhu mechanismu.

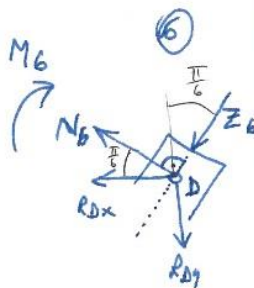
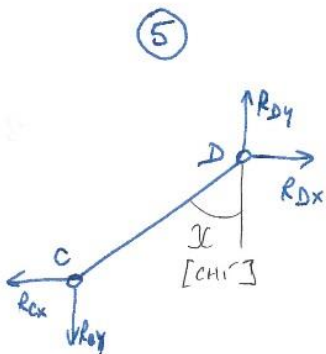
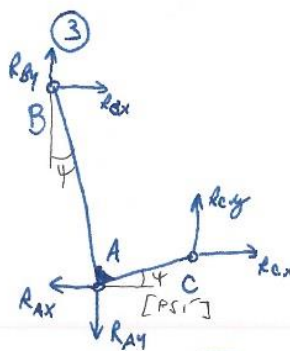
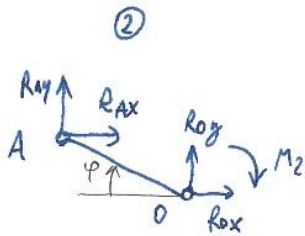
$D: z_4, z_6, \overline{OA} = r, \overline{AB} = a, \overline{AC} = b,$   
 $\overline{CD} = c, \varphi$   
 $u: M_2$

- STUPNĚ VOLNOSTI:

$$n = 3(6-1) - 2(5+2) = 1$$

→ SOUSTAVA JE STATICKY UVEDTA, POHYBLIVÁ → LZE PŘEDPISAT JEDEN PARAMETR (ÚHEL  $\varphi$ )

- UVOLNĚNÍ



- ROVNICE ROVNOVÁHY

②

$x: R_{ax} + R_{ox} = 0$   
 $y: R_{ay} + R_{oy} = 0$   
 $M_b: -M_2 - R_{ax} \cdot r \cdot \sin \varphi - R_{ay} \cdot r \cdot \cos \varphi = 0$

③

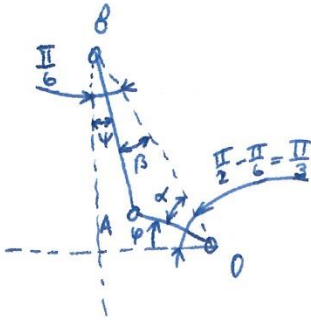
$x: R_{bx} + R_{cx} - R_{dx} = 0$   
 $y: R_{by} + R_{cy} - R_{dy} = 0$   
 $M_A: R_{cy} \cdot b \cdot \cos \varphi - R_{cx} \cdot b \cdot \sin \varphi - R_{bx} \cdot a \cdot \cos \varphi - R_{by} \cdot a \cdot \sin \varphi = 0$

$\textcircled{4} \quad x: -R_{bx} + N_4 \cos \frac{\pi}{6} + Z_4 \sin \frac{\pi}{6} = 0$   
 $y: -R_{by} + N_4 \sin \frac{\pi}{6} - Z_4 \cos \frac{\pi}{6} = 0$   
 $M_B: M_4 = 0$

$\textcircled{5} \quad x: R_{dx} - R_{cx} = 0$   
 $y: R_{dy} - R_{cy} = 0$   
 $M_C: R_{dy} \cdot c \cdot \sin \xi - R_{cx} \cdot c \cdot \cos \xi = 0$

$\textcircled{6} \quad x: -R_{dx} - N_6 \cos \frac{\pi}{6} - Z_6 \sin \frac{\pi}{6} = 0$   
 $y: -R_{dy} + N_6 \sin \frac{\pi}{6} - Z_6 \cos \frac{\pi}{6} = 0$   
 $M_D: M_6 = 0$

-URDENI CHLU  $\Psi$



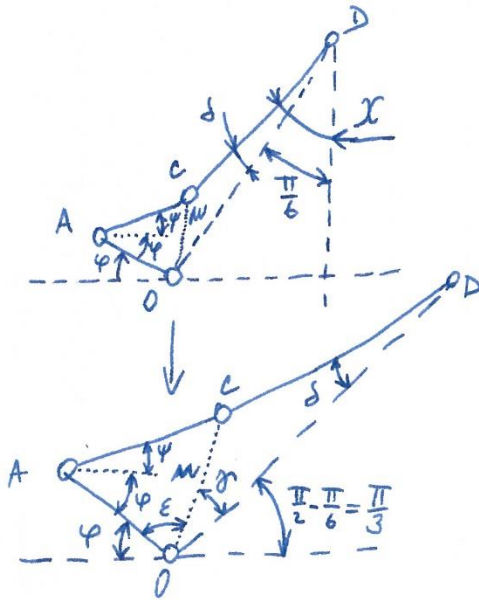
$$\Psi = \frac{\pi}{6} - \beta$$

$$\frac{\sin \beta}{r} = \frac{\sin \alpha}{a}$$

$$\alpha = \frac{\pi}{3} - \Psi$$

$$\Psi = \frac{\pi}{6} - a \sin \left[ \frac{r}{a} \sin \left( \frac{\pi}{3} - \Psi \right) \right]$$

-URDENI CHLU  $\chi$



$$\chi = \frac{\pi}{6} + \delta$$

$$\frac{\sin \delta}{w} = \frac{\sin \gamma}{c}$$

$$\gamma = \pi - \left( \frac{\pi}{3} + \Psi + \epsilon \right)$$

$$\frac{\sin \epsilon}{b} = \frac{\sin (\Psi + \epsilon)}{w}$$

$$w = \sqrt{r^2 + b^2 - 2rb \cos (\Psi + \epsilon)}$$

$$\chi = \frac{\pi}{6} + a \sin \left\{ \frac{w}{c} \sin \left[ \frac{2}{3} \pi - a \sin \left( \frac{b}{w} \sin (\Psi + \epsilon) \right) - \Psi \right] \right\}$$