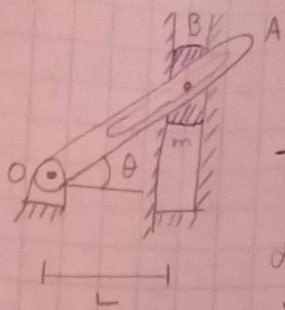
TEMA FECHA

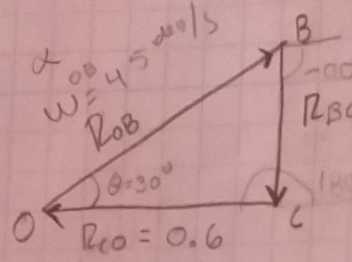
Tarea - ejercicio 1

$\theta = 30^\circ \quad \dot{\theta} = 45 \text{ deg/s} \quad \ddot{\theta} = 20 \text{ deg/s}^2$



$L = 0.6\text{m}$

- Determinar la aceleración de B



$R_{BC} = R_{CO} + R_{OB}$

$\omega_{BC} \quad \alpha_{BC}$?

$\theta_{CO} = 180$

$\theta_{BC} = -90$

$\alpha_{BC} = ?$

$\alpha_{OB} = 20 \text{ deg/s}$

$R_{OB} = 0.6928\text{m}$

$R_{CO} = 0.6$

$\Sigma \hat{\imath} = R_{CO}\cos\theta_{CO} + R_{OB}\cos\theta_{OB} = R_{BC}\cos\theta_{BC}$ (1)

$\Sigma \hat{\jmath} = R_{CO}\,\text{Sen}\theta_{CO} + R_{OB}\,\text{Sen}\,\theta_{OB} = R_{BC}\,\text{sen}\,\theta_{BC}$ (2)

Velocidades

$$\left[-R_{CO}\,\text{Sen}\,\theta_{CO} - R_{OB}\,\omega_{OB}\,\text{Sen}\,\theta_{OB} = -\dot{R}_{BC}\,\omega_{BC}\,\text{Sen}\,\theta_{BC}\right]\hat{\imath} \quad (3)$$

$$\left[R_{CO}\cos\theta_{CO} + R_{OB}\,\omega_{OB}\cos\theta_{OB} = \dot{R}_{BC}\,\omega_{BC}\cos\theta_{BC}\right]\hat{\jmath} \quad (4)$$

Para encontrar R_{OB} de (1)

$0.6\cos(180) + R_{OB}\cos(30) = R_{BC}\cos(-90)^0$

$$R_{OB} = \frac{-0.6\cos(180)}{\cos(30)} = 0.6928\text{m}$$

Aceleraciones

$$\left[-R_{CO}\cos\theta_{CO} - R_{OB}\,\alpha_{OB}\,\omega_{OB}^2\cos\theta_{OB} = -\ddot{R}_{BC}\,\alpha_{BC}\,\omega_{BC}^2\cos\theta_{BC}\right]\hat{\imath} \quad (5)$$

$$\left[-R_{CO}\,\text{Sen}\,\theta_{CO} - R_{OB}\,\alpha_{OB}\,\omega_{OB}^2\,\text{Sen}\,\theta_{OB} = -\ddot{R}_{BC}\,\alpha_{BC}\,\omega_{BC}^2\,\text{Sen}\,\theta_{BC}\right]\hat{\jmath} \quad (6)$$

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Ejercicio

Continuación ejercicio →

Para encontrar R_{BC} de (2)

$$0.6\,Sen(180) + 0.6928\,sen(30) = R_{BC}\,Sen(-90)$$

$$R_{BC} = \frac{0.6928\,sen(30)}{sen(-90)} = \underline{0.3464\,m}$$

Para $\dot{R}_{BC}$

$$\dot{R}_{BC} = \frac{R_{CO}\,Sin\,180 + R_{OB}\,Sen30}{Sen(-90)} = 0.3464\,^{m}/_{s}$$

Para w_{BC}

$$w_{BC}^{2} = \frac{R_{BC}\,Sin\,-90 - R_{CO}\,Sen\,180}{R_{OB}\,Sen(30)\,\theta} = 2.865 \therefore w_{BC} = 1.691\,^{rad}/_{s}$$

$$\alpha_{BC} = \frac{-0.6928 \cdot 0.349 \cdot 0.7853^{2}\,Sen30}{2.865\,Sen-90} = 0.033\,^{rad}/_{s^{2}}$$

TEMA

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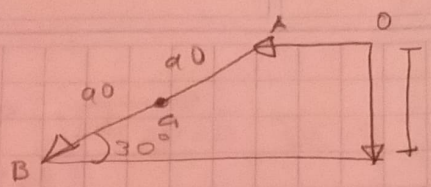
(2)

θ_{OA}, ω_{OA} = var
solo R_{OA} es const.



80 θ_{OC}, ω_{OC} y R_{OC} son constantes

$R_{OA} + R_{AB} = R_{OC} + R_{BC}$

$\sum \hat{i} = R_{OA}\cos\theta_{OA} + R_{AB}\cos\theta_{AB} = 0 + R_{BC}(-1)$ (1) R_{AB} const

$\sum \hat{j} = R_{OA}\operatorname{Sen}\theta_{OA} + R_{AB}\operatorname{sen}\theta_{AB} = 1$ (2)

velocidades $\theta_{AB} = \operatorname{sen}^{-1}\left(\frac{80}{180}\right) = 210$

$-R_{OA}\operatorname{sen}(\theta_{OA})\omega_{OA} - R_{AB}\operatorname{Sen}(\theta_{AB})\omega_{AB} = -R_{BC}$ (3)

$R_{OA}\cos(\theta_{OA})\omega_{OA} + R_{AB}\cos(\theta_{AB})\omega_{AB} = 0$ (4)

$$\omega_{AB} = \frac{-R_{OA}\operatorname{Sen}\theta_{OA}\omega_{OA}}{R_{AB}\cos(\theta_{AB})} = 3.07 \text{ rad/s}$$

$R_{BC} = -60 \cdot -80\operatorname{sen}(180) - 180\operatorname{sen}210 \cdot 3.07$
$= 277.11 \text{ mm}$

aceleraciones

$-R_{OA}\operatorname{Sen}\theta_{OA}\alpha - R_{OA}\omega_{OA}^2\cos(\theta_{OA}) - R_{AO}\alpha_{AO}\operatorname{Sen}\theta_{AO} - R_{AO}\cos\theta_{AO}\omega_{AO}^2 = 0$

$R_{OA}\cos\theta_{OA}\alpha - R_{OA}\operatorname{Sen}\theta_{OA}\omega^2 + R_{AO}\cos\theta_{AO}\alpha - R_{AO}\operatorname{sen}\theta_{AO}\omega_{AO}^2 = 0$

$$\alpha_{AO} = \frac{80 \cdot 3.07^2[\cos\theta_{AB} + \operatorname{Sen}\theta_{AB}] + R_{OA}\omega_{OA}^2}{-90(\operatorname{Sen}\theta_{AB} - \cos\theta_{AB})}$$

$= 9.4 \text{ rad/s}^2$