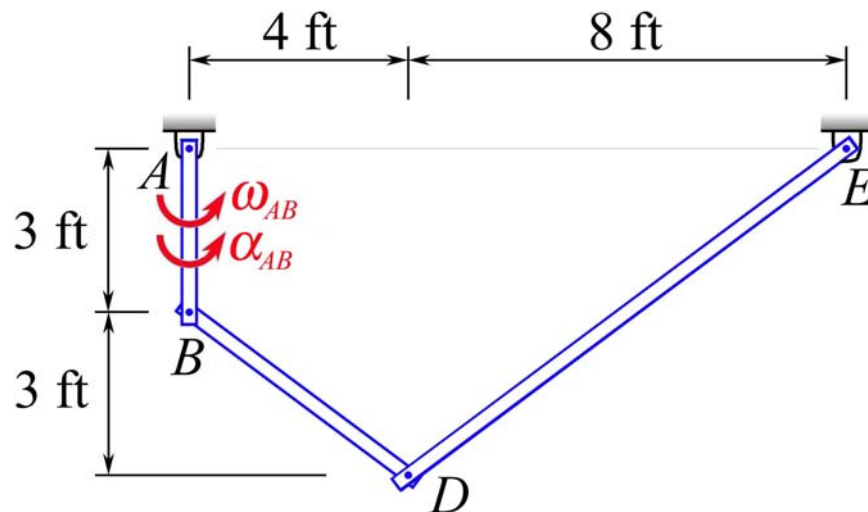


MEEG 2013 Quiz #5

A four-bar linkage is shown, where crank AB rotates with $\omega_{AB} = 10 \text{ rad/s } \curvearrowright$ and $\alpha_{AB} = 12 \text{ rad/s}^2 \curvearrowright$. Determine ω_{DE} and α_{DE} of link DE in this position.



(a) $\omega_{BD} = 5 \text{ rad/s } \curvearrowright$, $\omega_{DE} = 2.5 \text{ rad/s } \curvearrowright$ ⑤

(b) Assume that $\alpha_{BD} = \alpha_{BD} \curvearrowright$ and $\alpha_{DE} = \alpha_{DE} \curvearrowright$.

$$\alpha_{B/A} = \alpha_{B/D} + \alpha_{D/E} :$$

$$\begin{bmatrix} 3 & 6 \\ 4 & -8 \end{bmatrix} \begin{bmatrix} \alpha_{BD} \\ \alpha_{DE} \end{bmatrix} = \begin{bmatrix} -114 \\ 337.5 \end{bmatrix} \quad \begin{array}{l} \alpha_{BD} = 23.1875 \\ \alpha_{DE} = -30.59375 \end{array}$$

$\therefore \alpha_{BD} = 23.2 \text{ rad/s}^2 \curvearrowright$, $\alpha_{DE} = 30.6 \text{ rad/s}^2 \curvearrowright$ ⑤