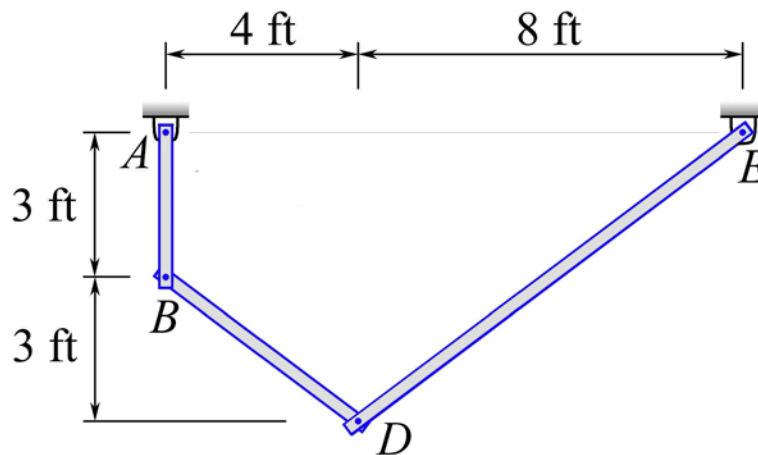


MEEG 4003 [Quiz #15.m11.093](#)

⑩ In the position shown, the link DE of the four-bar linkage rotates with $\boldsymbol{\omega}_{DE} = 2.5 \text{ rad/s } \curvearrowright$ and $\boldsymbol{\alpha}_{DE} = 2 \text{ rad/s}^2 \curvearrowright$. For this position, determine (a) the angular velocities $\boldsymbol{\omega}_{AB}$ and $\boldsymbol{\omega}_{BD}$ of links AB and BD , (b) the acceleration \mathbf{a}_D of pin D .



(a) $\boldsymbol{\omega}_{AB} = 10 \text{ rad/s } \curvearrowright$ ③ $\boldsymbol{\omega}_{BD} = 5 \text{ rad/s } \curvearrowright$ ③

(b)

$$\begin{aligned} \mathbf{a}_D &= \mathbf{a}_{D/E} + \mathbf{a}_E = \mathbf{a}_{D/E} + \mathbf{0} = \mathbf{a}_{D/E} \\ &= \frac{10(2)}{5}(3\mathbf{i} - 4\mathbf{j}) + \frac{10(2.5)^2}{5}(4\mathbf{i} + 3\mathbf{j}) \end{aligned}$$

$$\mathbf{a}_D = 62\mathbf{i} + 21.5\mathbf{j} \text{ ft/s}^2 \quad \text{④}$$