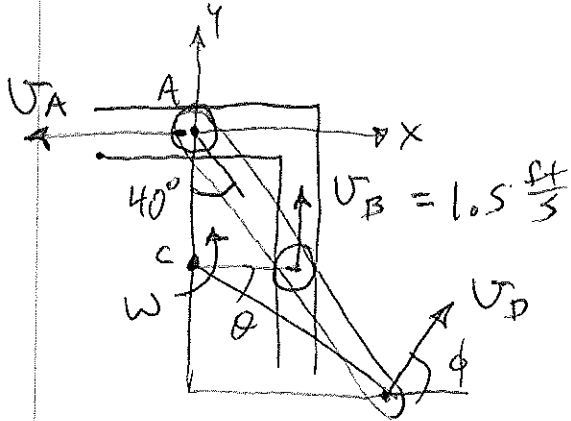


PROB. 15-85



a) FIND ω

$$v_B = r_{CB} \omega, \quad \omega = \frac{v_B}{r_{CB}}$$

$$r_{CB} = 5 \sin 40^\circ = 3.214 \text{ ft}$$

$$\omega = \frac{(1.5 \frac{\text{ft}}{\text{s}})}{(3.214 \text{ ft})} = 0.4667 \frac{\text{RAD}}{\text{s}}$$

b) FIND $v_D = r_{CD} \omega$

$$x_C = 0, \quad y_C = -5 \cos 40^\circ = -3.830 \text{ ft}$$

$$x_D = 10 \sin 40^\circ = 6.428 \text{ ft}$$

$$y_D = -10 \cos 40^\circ = -7.660 \text{ ft}$$

$$r_{CD} = \sqrt{6.428^2 + 3.832^2} = 7.482 \text{ ft}$$

$$\theta = \tan^{-1}\left(\frac{3.83}{6.428}\right) = 30.79^\circ$$

$$\phi = 90 - 30.79 = 59.21^\circ$$

$$v_D = (7.482 \text{ ft}) \left(0.4667 \frac{\text{RAD}}{\text{s}}\right) = 3.492 \frac{\text{ft}}{\text{s}} \angle 59.21^\circ$$