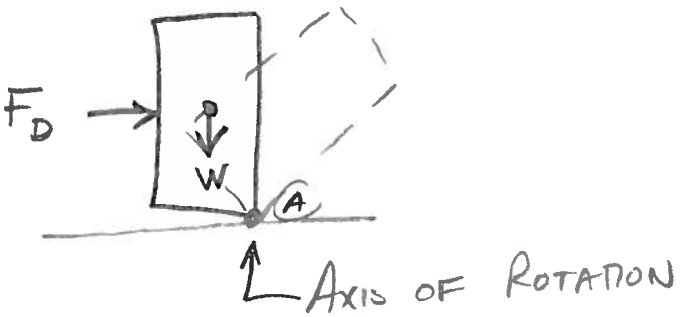
11.16



$\circlearrowleft \Sigma M_A = 0 = W(D/2) - F_D(H/2)$

$W(D/2) = F_D(H/2)$

$mg(D/2) = F_D \frac{H}{2}$

$F_D = C_D A \frac{\rho V^2}{2}$

$= C_D HD \frac{\rho V^2}{2}$

$\therefore$

$\frac{mgD}{2} = C_D HD \frac{\rho V^2}{2} \cdot \frac{H}{2}$

SOLVE FOR V

11.16 (CONTINUED)

$$V = \sqrt{mg\frac{D}{H}\cdot\frac{2}{\rho C_D H D}} = \sqrt{\frac{2mg}{H^2 \rho C_D}}$$

$$= \sqrt{\frac{2(22\,kg)(9.81\,m/s^2)}{(0.88\,m^2)(1.2\,kg/m^3)(1.2)}} = 19.7\,m/s$$