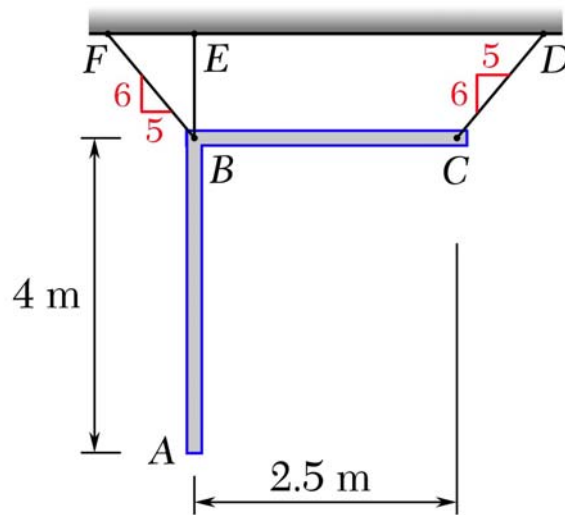


MEEG 2013 [Quiz #6.m23.082](#)

1. ② Including a sketch, describe the *vectors* to be shown on the *effective-force diagram* for a rigid body in plane motion.

2. ⑧ The slender bent rod ABC with $\rho_L = 10 \text{ kg/m}$ is suspended as shown. Determine its angular acceleration α and the wire tensions F_{BE} and F_{CD} immediately after the wire BF is cut.



1. **Sketch:** ① Suppose that a rigid body in plane motion has a mass m , an angular acceleration α , a mass center G accelerating with \bar{a} , and a moment of inertia \bar{I} about its central axis. Then, the *effective-force diagram* for this body has (a) an effective force vector $m\bar{a}$ acting through G , (b) an effective moment vector $\bar{I}\alpha$ acting about G . ①

2. **FBD = EFD** ②

$$\alpha = 0.827615 \quad \alpha = 0.828 \text{ rad/s}^2 \curvearrowright \quad ②$$

$$F_{CD} = 148.669 \quad F_{CD} = 148.7 \text{ N} \quad ②$$

$$F_{BE} = 497.576 \quad F_{BE} = 498 \text{ N} \quad ②$$