1. A precast concrete wall section is temporarily held by two cables as shown in *Figure 1*. Knowing that the tensions in cables *ED* and *FE* are 900 *N* and 675 *N*, respectively, determine the moment about point *O* of the force exerted by **(a)** cable *ED*, **(b)** cable *FE*. **(25%)**
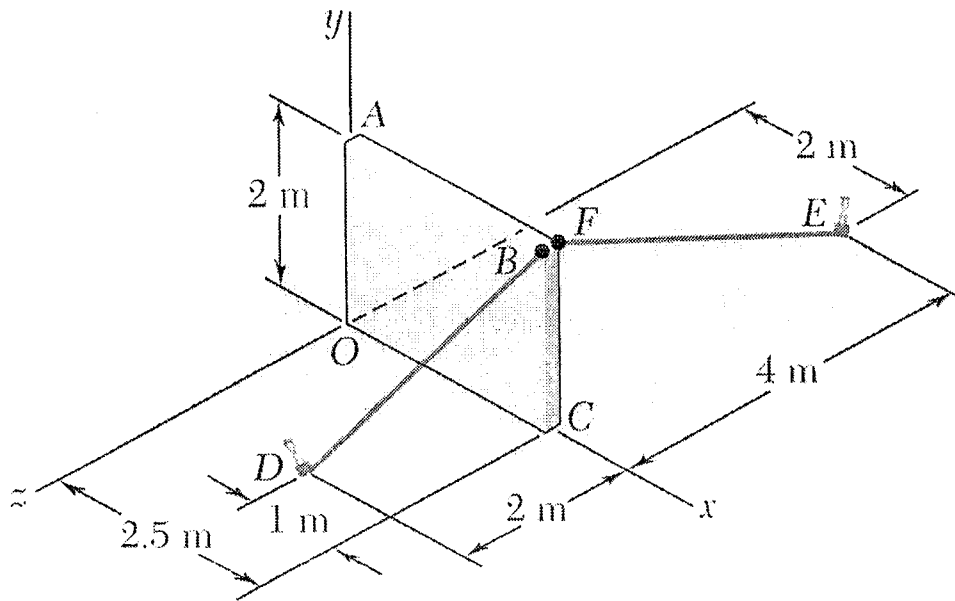

Figure 1.

2. Determine the moment of inertia **and** the radius of gyration of the shaded area with respect to the *x* axis as shown in *Figure 2*. **(25%)**
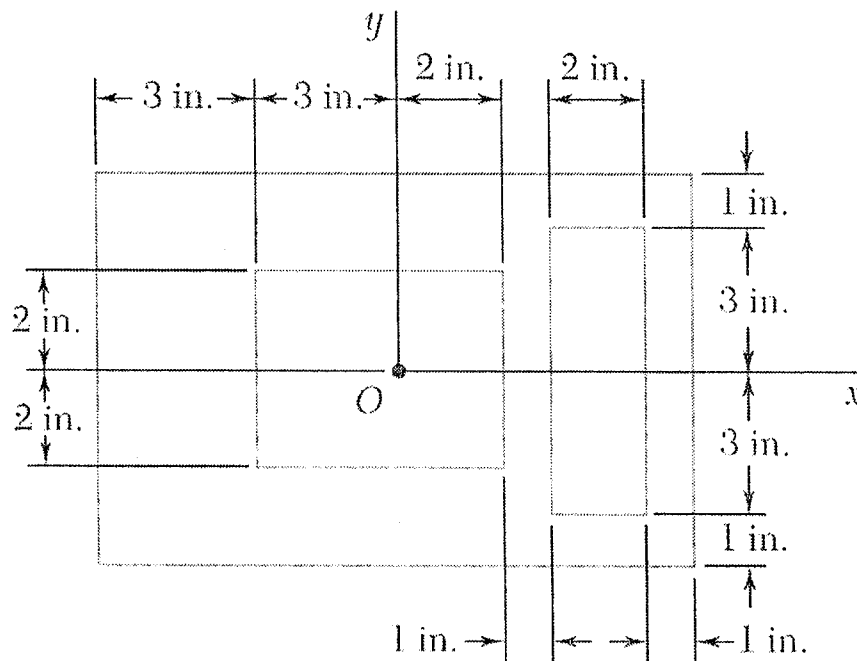

Figure 2.

3. A 40-*kg* package is at rest on an incline when a force P is applied to it as shown in *Figure* 3. Determine the magnitude of P if 4 *sec* is required for the package to travel 10*m* up the incline. The static and kinetic coefficients of friction between the package and the incline are 0.30 and 0.25, respectively. **(25%)**
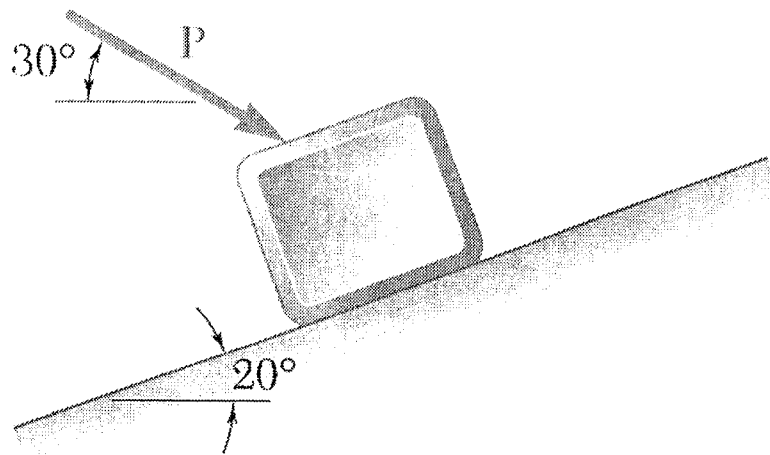

Figure 3.

4. Bar *AB* rotates clockwise with a constant angular velocity of 4 *rad/s*. Knowing that the magnitude of the velocity of collar *D* is 20 *ft/s* and that the angular velocity of bar *BD* is counterclockwise at the instant shown in *Figure* 4, determine **(a)** the angular velocity of bar *EF*, **(b)** the relative velocity of collar *D* with respect to rod *EF*. **(25%)**
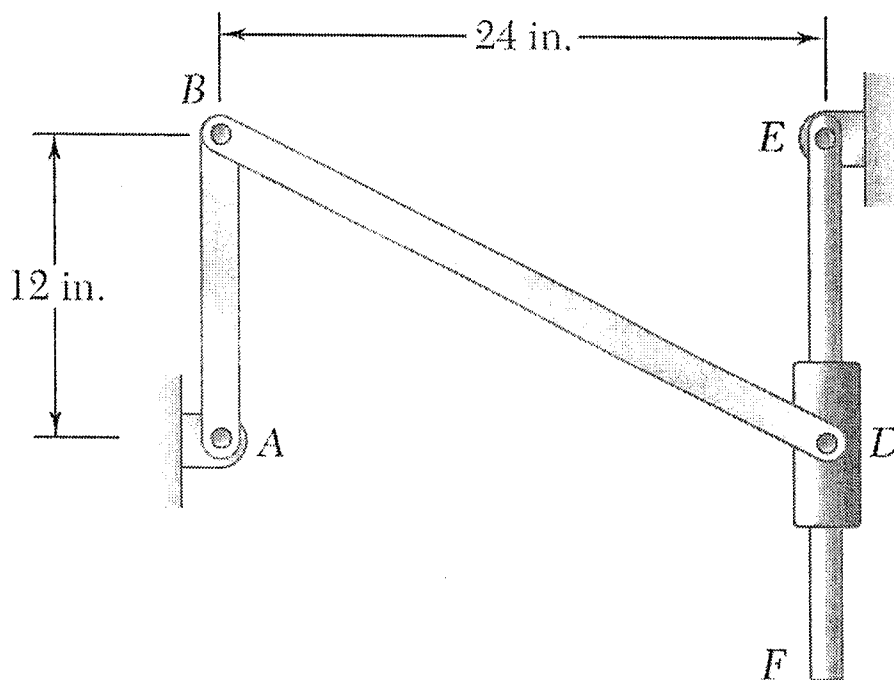

Figure 4.