UNIVERSITY of ARKANSAS
1871

MEEG 2003 **Name:** _____

(Underline your **last name**.)

Test III ( ) **ID#:** _____

1. (30%) The centroid of the shaded area shown is at $C(\bar{x}, \bar{y})$. Determine (*a*) the moments of inertia I_x, (*b*) the radius of gyration k_x, (*c*) the ordinate $\bar{y}$ of *C*, (*d*) the centroidal moment of inertia $\bar{I}_{x'}$, (*e*) the moments of inertia I_y.

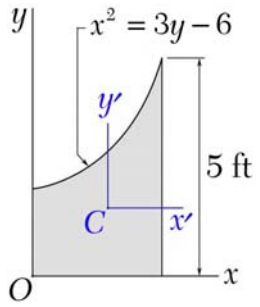

Fig. P1

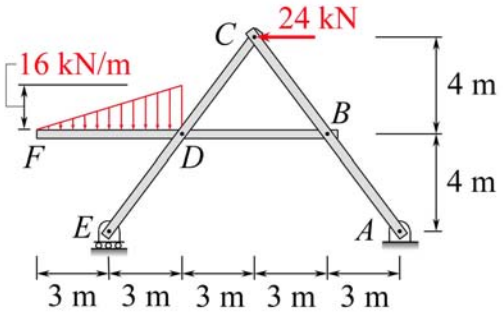

Fig. P2

2. (30%) A frame is loaded as shown. Determine the forces exerted by the pins on the pinholes of member *ABC*.

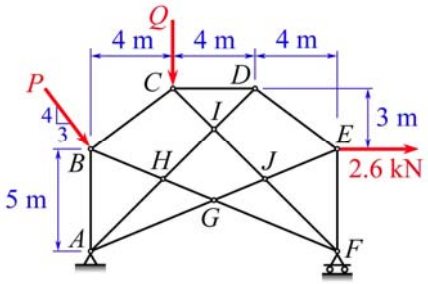

Fig. P3 *A*&*B*

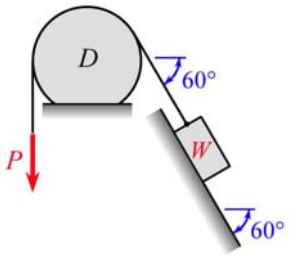

Fig. P3 *C*&*D*

3. (5% each) *Circle on this test sheet* the correct or nearest item for each of the following:

A. A truss is shown, where *P* = 19.60 kN and *Q* = 2.1 kN. The magnitude of F_{AB} in member *AB* is
(*a*) 20.0 kN. (*b*) 21.4 kN. (*c*) 22.7 kN. (*d*) 24.0 kN. (*e*) 25.3 kN. (*f*) 26.7 kN. (*g*) 28.0 kN.

B. A truss is shown, where *P* = 19.60 kN and *Q* = 2.1 kN. The magnitude of F_{HG} in member *HG* is
(*a*) 6.11 kN. (*b*) 5.72 kN. (*c*) 5.33 kN. (*d*) 4.94 kN. (*e*) 4.55 kN. (*f*) 4.16 kN. (*g*) 3.77 kN.

C. If $\mu_s = 0.6$ between *all* surfaces of contact and the block has a weight of *W* = 27 lb, the minimum force **P** to pull the block up the incline is
(*a*) 145.8 lb. (*b*) 151.4 lb. (*c*) 157.1 lb. (*d*) 162.7 lb. (*e*) 168.3 lb. (*f*) 173.9 lb. (*g*) 179.5 lb.

D. If $\mu_s = 0.6$ between *all* surfaces of contact and the block has a weight of *W* = 27 lb, the minimum force **P** to keep the block from sliding down the incline is
(*a*) 3.88 lb. (*b*) 3.77 lb. (*c*) 3.65 lb. (*d*) 3.53 lb. (*e*) 3.41 lb. (*f*) 3.29 lb. (*g*) 3.18 lb.

4. (20%) Non-numerical problem.