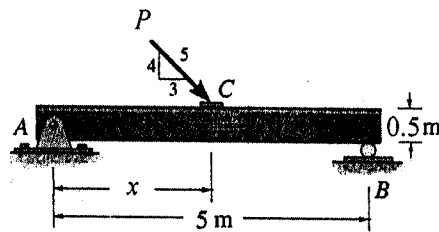
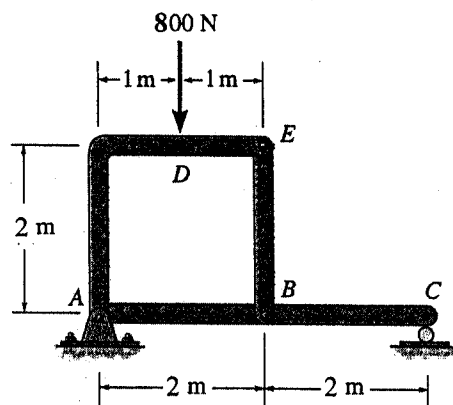


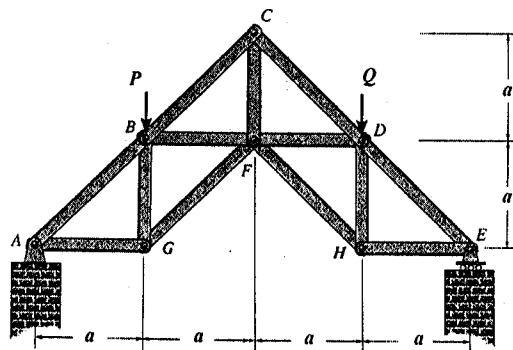
1. The simple beam  $AB$  supports an inclined load  $P$  at distance  $x$  from point  $A$  (see figure). Determine the distance  $x$  for which the reaction forces at  $A$  and  $B$  have the same magnitude. (20%)



2. The frame shown consists of three pin-connected members  $ADE$ ,  $EB$  and  $ABC$ . Determine the components of the forces acting on each member of the frame. (20%)

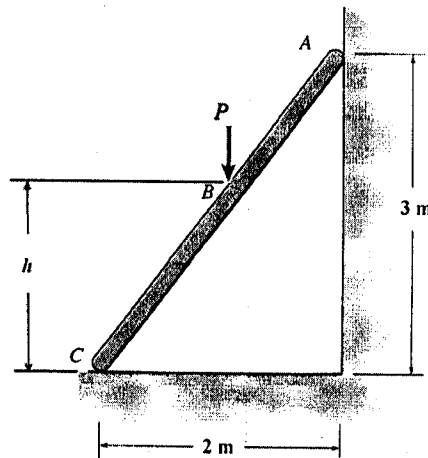


3. A simple truss is subjected to two loads  $P = 10 \text{ kN}$  and  $Q$  (see figure). If the truss remains in equilibrium when member  $DF$  is removed, determine the force in each member of the truss. (20%)



(背面仍有題目,請繼續作答)

4. The rod rests on the rough floor at  $C$  and against the rough wall at  $A$ , as shown in the figure, with a load  $P$  acting at point  $B$ . Knowing that the coefficient of friction is  $\mu_s = 0.3$  at  $A$  and  $\mu_s = 0.4$  at  $C$ , and neglecting the weight of the rod, determine the largest value of  $h$  for which equilibrium is maintained. (20%)



5. The three forces acting on the block are

$$\mathbf{F}_1 = \{i - 2j + 2k\} \text{N},$$

$$\mathbf{F}_2 = -\mathbf{F}_1,$$

$$\mathbf{F}_3 = \{-4i + 5j + 6k\} \text{N}.$$

Replace the three forces by a wrench. Determine the force and couple moment for the wrench and the coordinates  $x$  and  $y$  where the line of action of the force intersects the  $x$ - $y$  plane. (20%)

