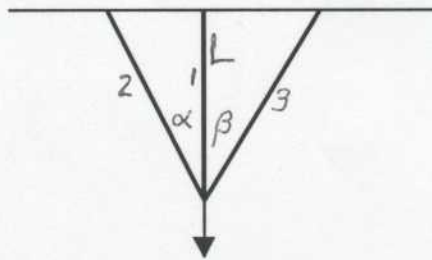


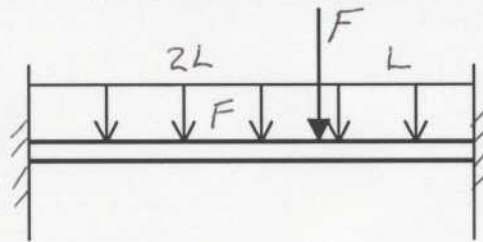
Show all work

All materials are rigid/perfectly plastic.

1. The members of the pin connected truss have the same yield stress and cross section. What are possible collapse mechanisms? Which will occur if  $\beta > \alpha$ ? Find the collapse load  $P_0$  if  $\alpha = 30^\circ$  and  $\beta = 45^\circ$ ?



2. A doubly cantilevered beam of length  $3L$  and yield moment  $M_0$ , supports a concentrated load  $F$  (total) and a distributed load  $F$  as shown. By assuming a mechanism with yield hinges at the ends and under the concentrated load, find an upper bound on the collapse load. Determine whether this upper bound is the collapse load, and if not, explain how one could get a better approximation.



3. The double panel frame is loaded proportionally as shown. All members have the same yield moment and cross section. Find the least upper bound by considering several plausible mechanisms.

