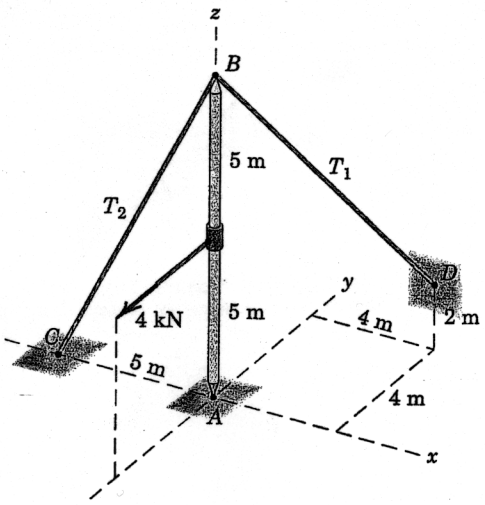
TAM 202 HW #3

3/65 The vertical mast supports the 4-kN force and is constrained by the two fixed cables BC and BD and by a ball-and-socket connection at A. Calculate the tension T_1 in BD. Can this be accomplished by using only one equation of equilibrium?

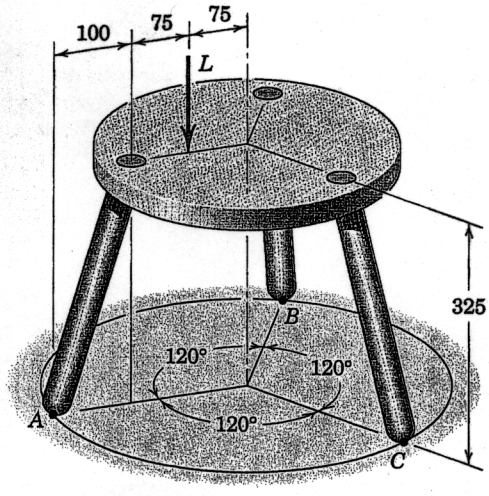
Ans. $T_1 = 4.90$ kN



Problem 3/65

3/69 A three-legged stool is subjected to the load L as shown. Determine the vertical force reaction under each leg. Neglect the weight of the stool.

Ans. $N_A = 0.533L$, $N_B = N_C = 0.233L$

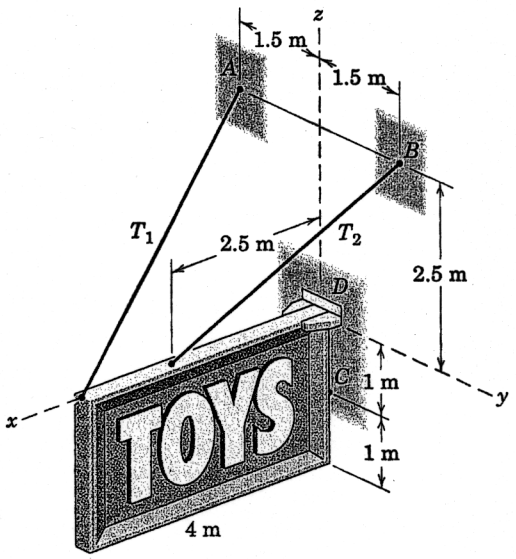


Dimensions in millimeters

Problem 3/69

►3/90 A rectangular sign over a store has a mass of 100 kg, with the center of mass in the center of the rectangle. The support against the wall at point C may be treated as a ball-and-socket joint. At corner D support is provided in the y-direction only. Calculate the tensions T_1 and T_2 in the supporting wires, the total force supported at C, and the lateral force R supported at D.

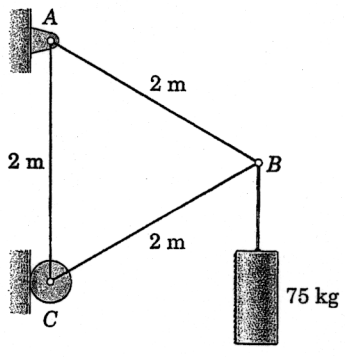
Ans. $T_1 = 347$ N, $T_2 = 431$ N
$R = 63.1$ N, $C = 768$ N



Problem 3/90

4/1 Determine the force in each member of the simple equilateral truss.

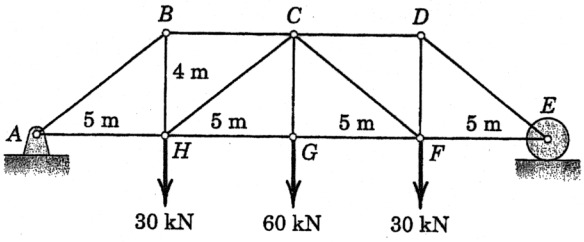
Ans. $AB = 736$ N T, $AC = 368$ N T, $BC = 736$ N C



Problem 4/1

4/7 Determine the force in each member of the loaded truss. Make use of the symmetry of the truss and of the loading.

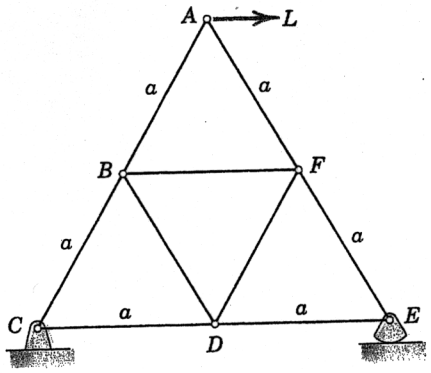
Ans. $AB = DE = 96.0$ kN C
$AH = EF = 75$ kN T, $BC = CD = 75$ kN C
$BH = CG = DF = 60$ kN T
$CH = CF = 48.0$ kN C, $GH = FG = 112.5$ kN T



Problem 4/7

4/15 The equiangular truss is loaded and supported as shown. Determine the forces in all members in terms of the horizontal load L.

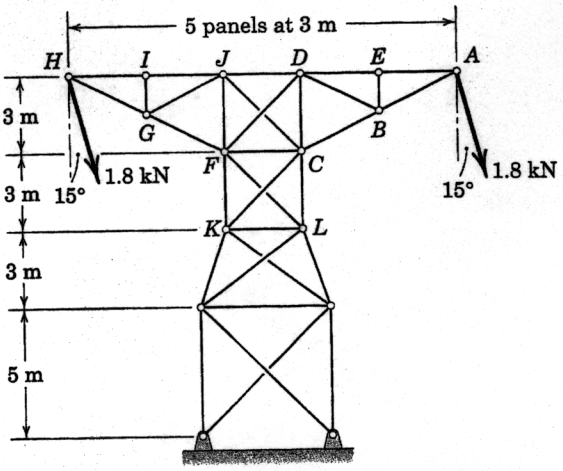
Ans. $AB = BC = L$ T, $AF = EF = L$ C
$DE = CD = L/2$ T, $BF = DF = BD = 0$



Problem 4/15

▶**4/27** The tower for a transmission line is modeled by the truss shown. The crossed members in the center sections of the truss may be assumed to be capable of supporting tension only. For the loads of 1.8 kN applied in the vertical plane, compute the forces induced in members AB, DB, and CD.

Ans. $AB = 3.89$ kN C, $DB = 0$, $CD = 0.932$ kN C



Problem 4/27