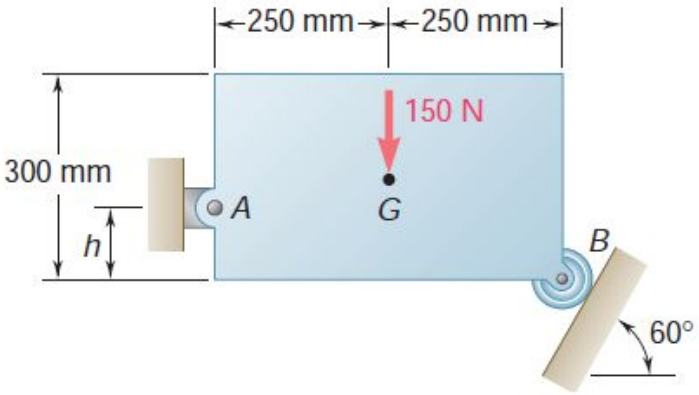
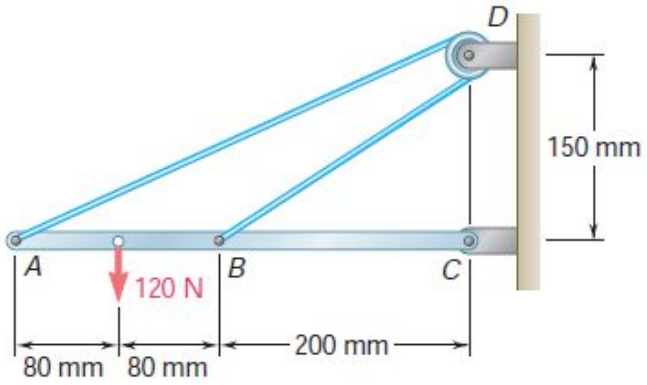
Assignment 2
ME 245

1. Determine the reactions at *A* and *B* when (a) h = 0, (b) h = 200 mm.



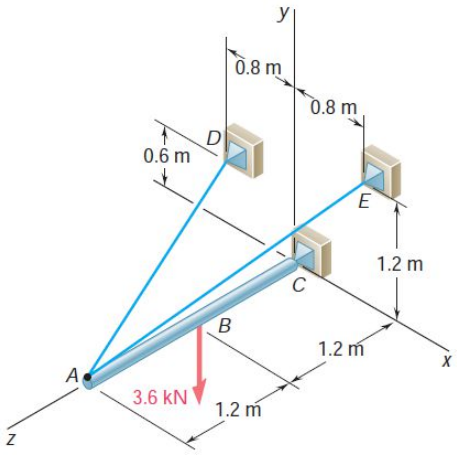
Ans.: (a)
$\mathbf{B} = 150.0\ \text{N} \angle 30.0°$
$\mathbf{A}_x = 129.9\ \text{N} \rightarrow$
$\mathbf{A}_y = 75\ \text{N} \uparrow$
$\mathbf{A} = 150.0\ \text{N} \angle 30.0°$

2. Neglecting friction and the radius of the pulley, determine (a) the tension in cable *ADB*, (b) the reaction at *C*. [Ans.: (a) T =130.0 N, (b) $\mathbf{C} = 224\ \text{N} \angle 2.05°$]

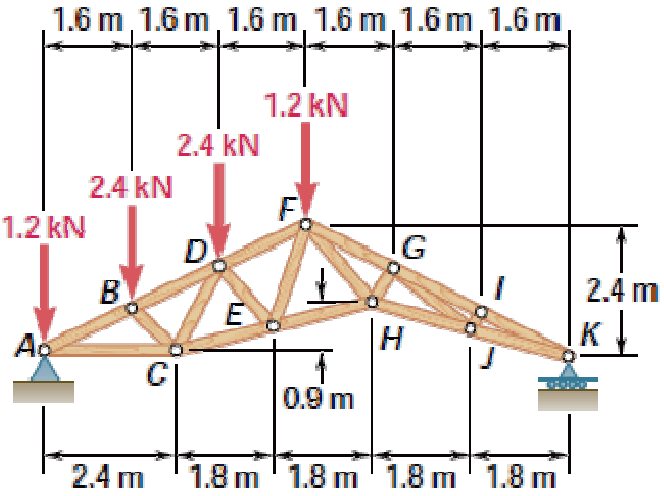


3. A 2.4-m boom is held by a ball-and-socket joint at *C* and by two cables *AD* and *AE*. Determine the tension in each cable and the reactions at *C*.

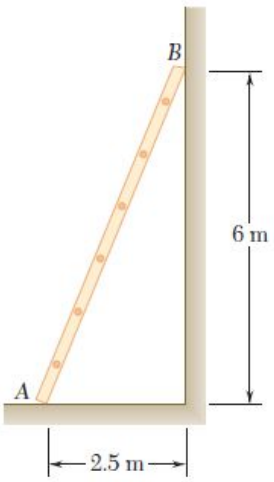
[Ans.: T_{AE} = 2.8 kN, T_{AD} = 2.6 kN,
$\boldsymbol{C}$ = 1.8 kN **j** + 4.8 kN **k**]



4. (a) Determine the force in members *EF, FH, EH* and *GH* of the vaulted roof truss shown using joint method. State whether each member is in tension or compression.
   (b) Validate the results of (a) using section method.



5. A 6.5 m ladder *AB* leans against a wall as shown. Assuming that the coefficient of static friction μ_s is the same at *A* and *B*, determine the smallest value of μ_s for which equilibrium is maintained.
   [Hint: Smallest value of μ_s for which equilibrium is maintained can be found considering the motion of point *A* and *B* is impending.]
   [Ans.: $\mu_s = 0.2$]



6. Class problems of the following:
   Portion 3: **3.2, 3.3, 3.8**
   Portion 4: **4.4, 4.5**
   Portion 5: **5.2**

Submission Date: 25 April, 2017 (class time)