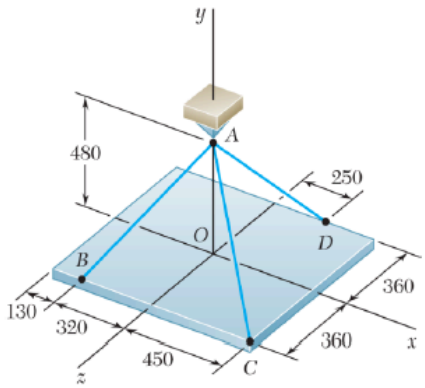
ES 208 Mechanics

Assignment 1
Due 4 September 2018
Submit hard copy to your tutorial instructor

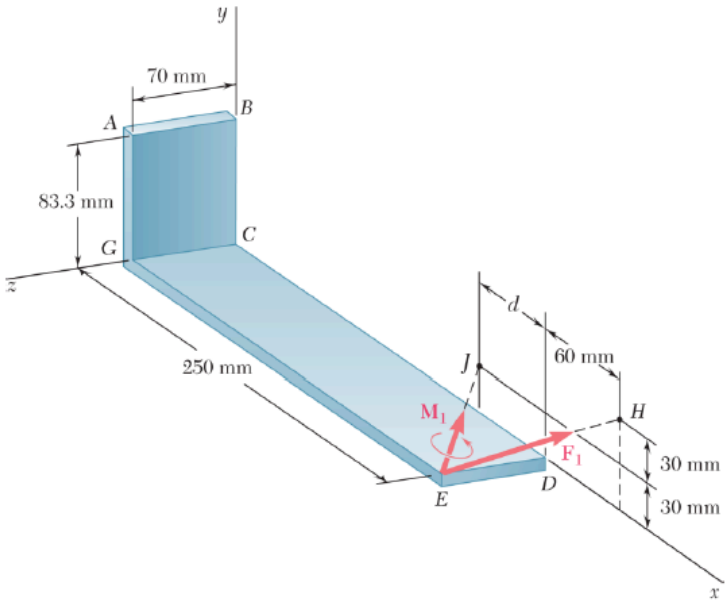
All problems are from the Beer and Johnston book.



Dimensions in mm

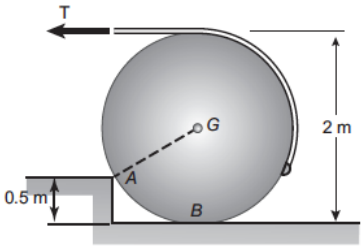
PROBLEM 2.96

For the plate of Prob. 2.89, determine the tensions in cables *AB* and *AD* knowing that the tension in cable *AC* is 54 N and that the resultant of the forces exerted by the three cables at *A* must be vertical.



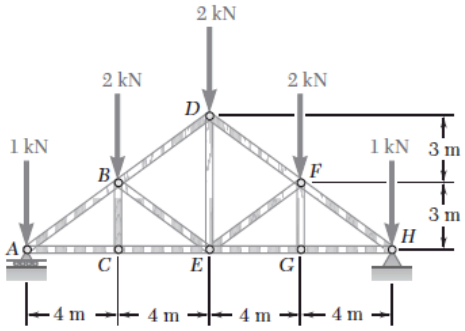
PROBLEM 3.156

A 77-N force $\mathbf{F}_1$ and a 31-N · m couple $\mathbf{M}_1$ are applied to corner *E* of the bent plate shown. If $\mathbf{F}_1$ and $\mathbf{M}_1$ are to be replaced with an equivalent force-couple system ($\mathbf{F}_2$, $\mathbf{M}_2$) at corner *B* and if $(M_2)_z = 0$, determine (*a*) the distance *d*, (*b*) $\mathbf{F}_2$ and $\mathbf{M}_2$.



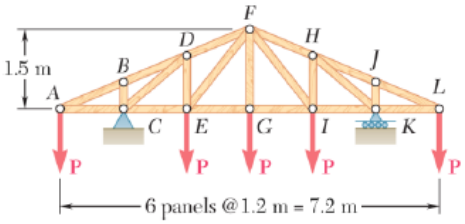
PROBLEM 4.61

A 2-kN cylindrical tank, 2 m in diameter, is to be raised over a 0.5-m obstruction. A cable is wrapped around the tank and pulled horizontally as shown. Knowing that the corner of the obstruction at *A* is rough, find the required tension in the cable and the reaction at *A*.



PROBLEM 6.12

Determine the force in each member of the Howe roof truss shown. State whether each member is in tension or compression.



PROBLEM 6.51

Determine the force in members *DE* and *DF* of the truss shown when $P = 20$ kN.