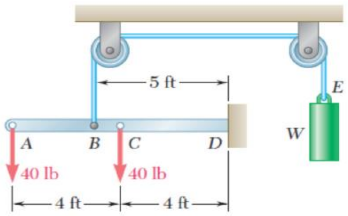
Department of Mechanical Engineering (NITC)

S1ME **ZZ1001D ENGINEERING MECHANICS** **Tutorial Test 4-Set 4**

Time: One Hour Maximum Marks: 20

1. For the beam and loading shown in Fig. 1, determine the range of values of *W* for which the magnitude of the couple at *D* does not exceed 40 lb ft.
2. Find the supporting force system for the cantilever beams connected to bar *AB* by pins (Fig. 2).



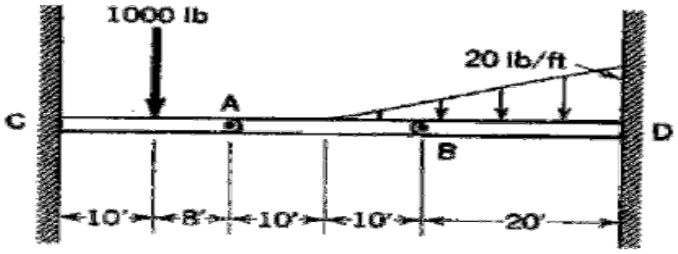


Figure 1 figure 2

----------P.T.O----------

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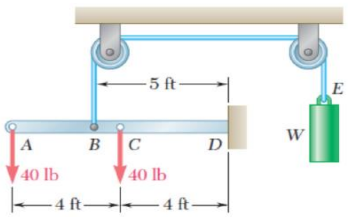

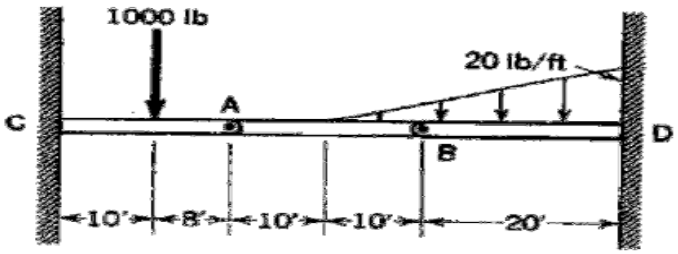

Figure 1 figure 2

----------P.T.O----------

3. If P = 6kN, x = 0.75 m and y = 1 m, determine the tension developed in cables *AB*, *CD*, and *EF* (Fig. 3). Neglect the weight of the plate.
4. Draw the free-body diagram of the dumpster *D* of the truck, which has a weight of 5000 lb and a centre of gravity at *G*. It is supported by a pin at *A* and a pin-connected hydraulic cylinder *BC* (short link). Explain the significance of each force on the diagram. (See Fig. 4.)

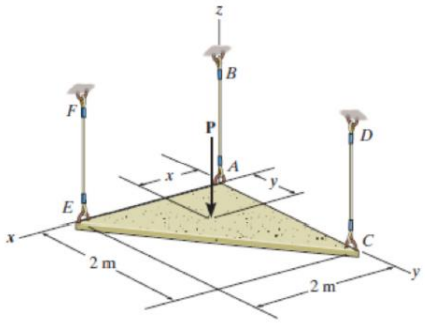

Figure 3

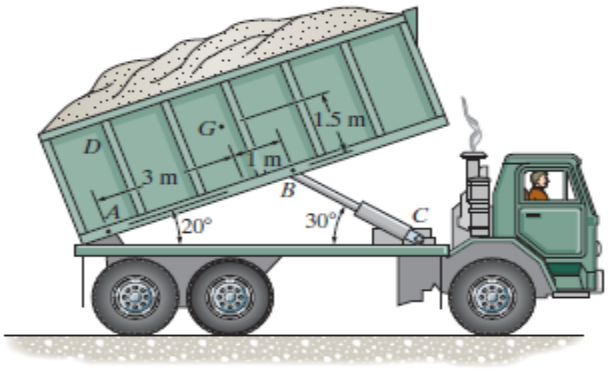

figure 4

3. If P = 6kN, x = 0.75 m and y = 1 m, determine the tension developed in cables *AB*, *CD*, and *EF* (Fig. 3). Neglect the weight of the plate.
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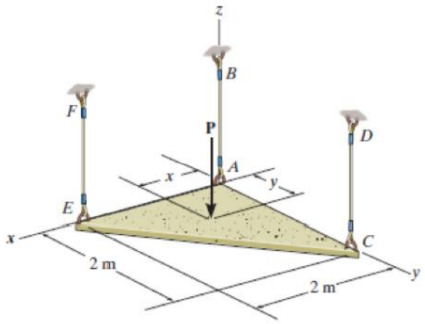

Figure 3

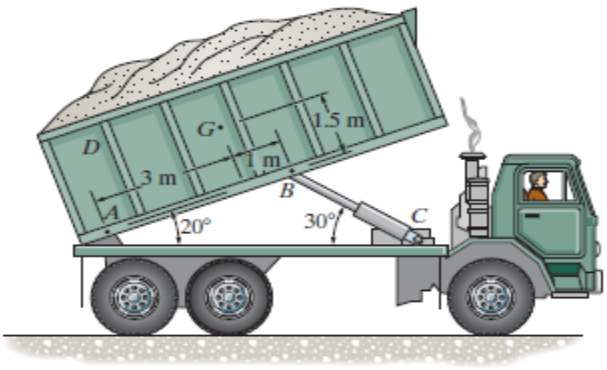

figure 4