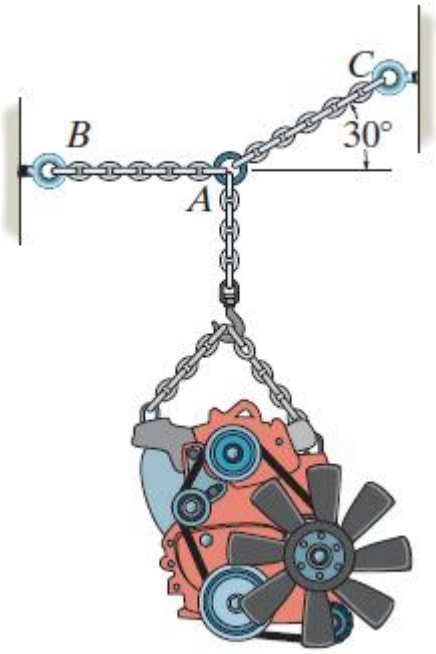
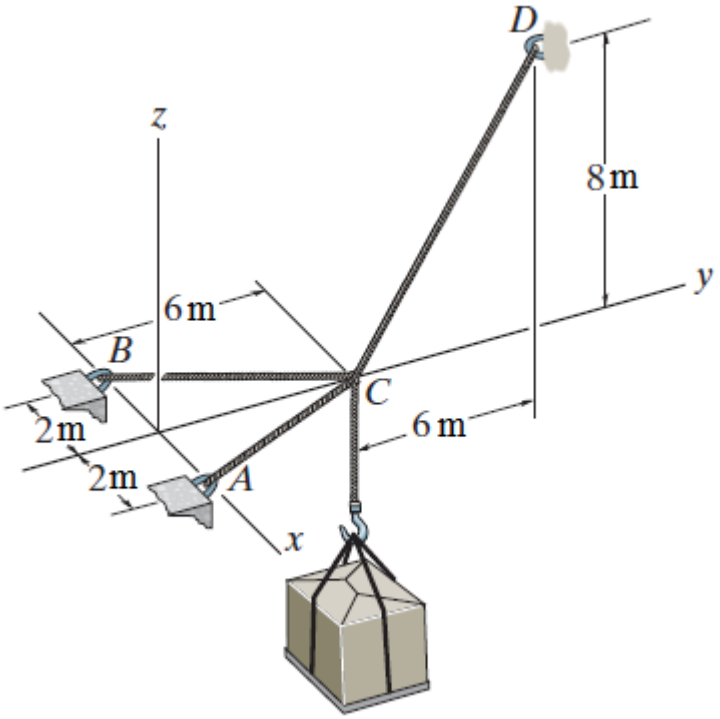
TOBB EKONOMİ VE TEKNOLOJİ ÜNİVERSİTESİ

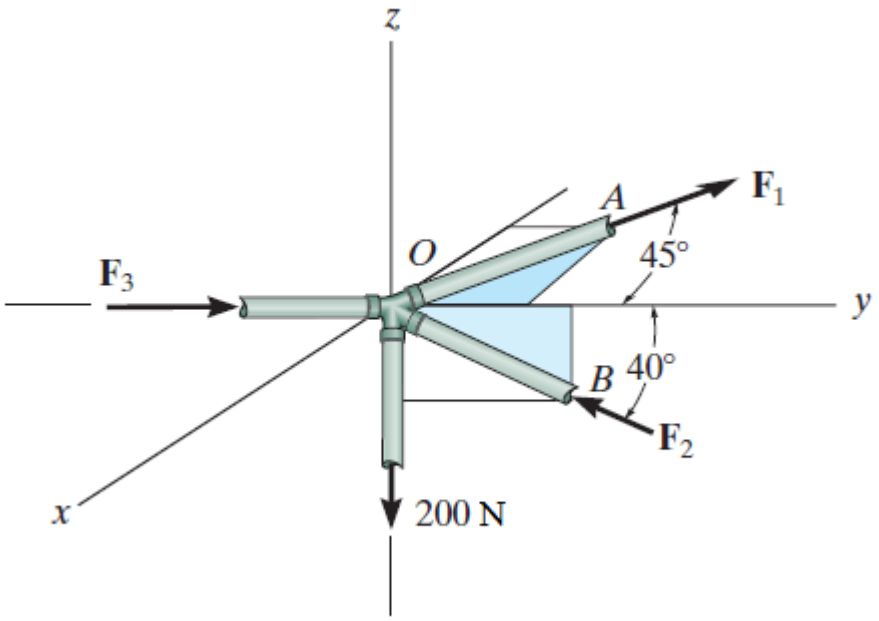
1. Determine the maximum weight of the engine that can be supported without exceeding a tension of 450 N in chain *AB* and 480 N in chain *AC* .



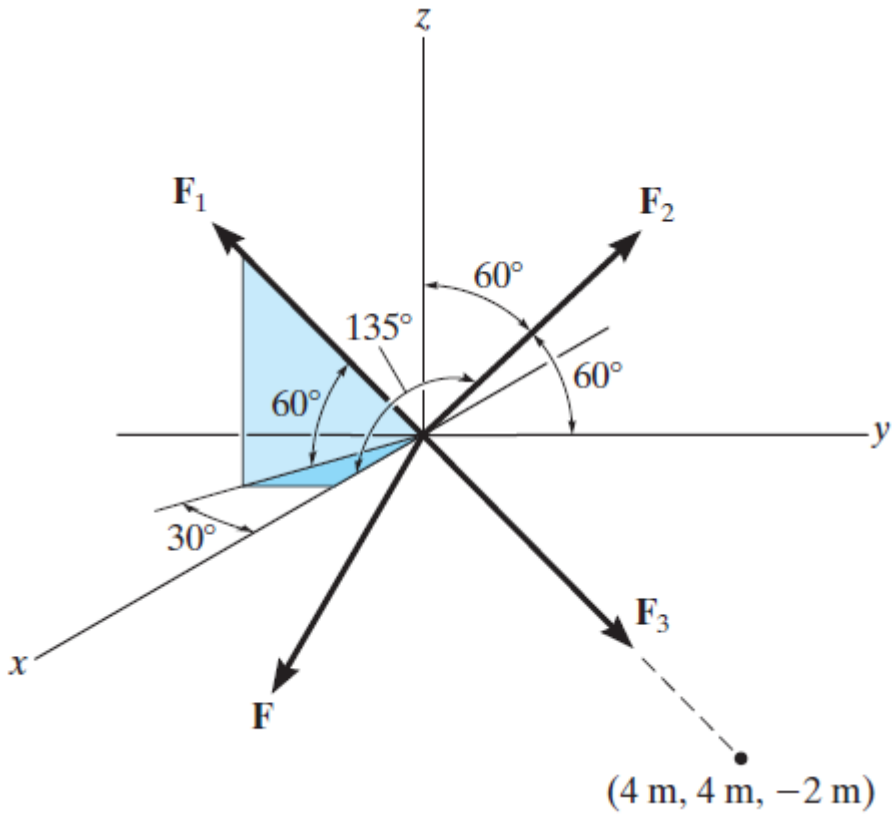
2. Determine the force in each cable needed to support the 500 N load.



3. The joint of a space frame is subjected to four member forces. Member *OA* lies in the *x-y* plane and member *OB* lies in the *y-z* plane. Determine the forces acting in each of the members required for equilibrium of the joint.



4. Determine the magnitudes of forces $\mathbf{F_1}$, $\mathbf{F_2}$, and $\mathbf{F_3}$ necessary to hold the force $\mathbf{F} = \{ -9\mathbf{i} - 8\mathbf{j} - 5\mathbf{k} \}$ kN in equilibrium.



5. Romeo tries to reach Juliet by climbing with constant velocity up a rope which is knotted at point *A* . Any of the three segments of the rope can sustain a maximum force of 2 kN before it breaks. Determine if Romeo, who has a mass of 65 kg, can climb the rope, and if so, can he along with Juliet, who has a mass of 60 kg, climb down with constant velocity?