1. Determine the magnitude and direction θ of force $\mathbf{F_A}$ shown in Fig.1 so that the resultant force of forces $\mathbf{F_A}$ and $\mathbf{F_B}$ is directed along the positive x axis and has a magnitude 1500 N.
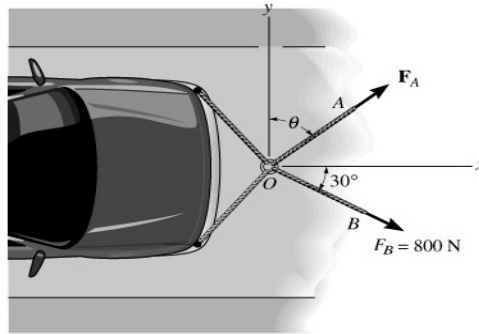

Fig. 1

2. The beam is subjected to the two forces $\mathbf{F_1}$ and $\mathbf{F_2}$ shown in Fig. 2. (A) Express each force in Cartesian vector form and (B) determine the magnitude and coordinate direction angles of the resultant force of forces $\mathbf{F_1}$ and $\mathbf{F_2}$.
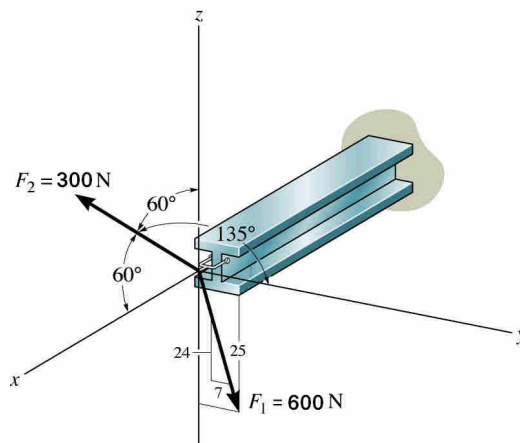

Fig. 2

3. Determine the maximum weight $\mathbf{W}$ of the block that can be suspended in the position shown in Fig. 3 if each cord can support a maximum tension 80 N.   Also, what is the angle θ for equilibrium?
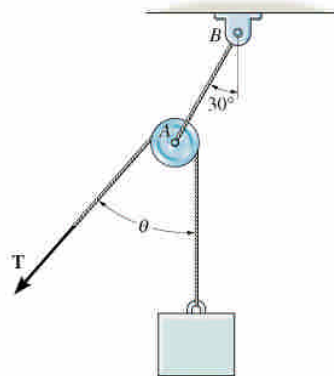

Fig. 3

4. The three cables are used to support the 800-N lamp in Fig. 4.   (A) Draw a free body diagram at the knot A.   (B) Write down the equations of equilibrium at the knot A.   (C) Determine the force developed in each cable for equilibrium.
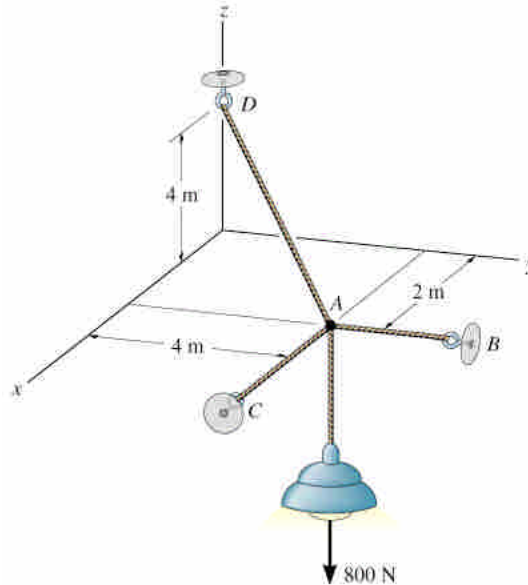

Fig. 4

5. The force $F = \{-40i + 20j + 10k\}$ N acts at point A shown in Fig. 5.   (A) Determine the moment of this force about the point O.   (B) Determine the moments of this force about the x and a axes, respectively.
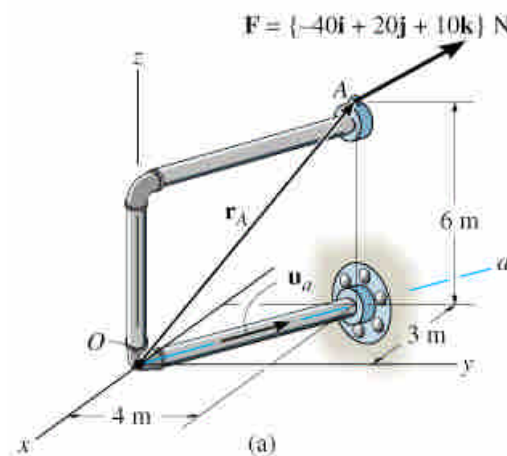

Fig. 5