BYG140 KONSTRUKSJONSMEKANIKK 1
Assignment (2)
(Statics Ch 3: Equlibrium of a particle & Ch 4: Force system resultants)

Question 1

3-39. The 30-kg pipe is supported at A by a system of five cords. Determine the force in each cord for equilibrium.

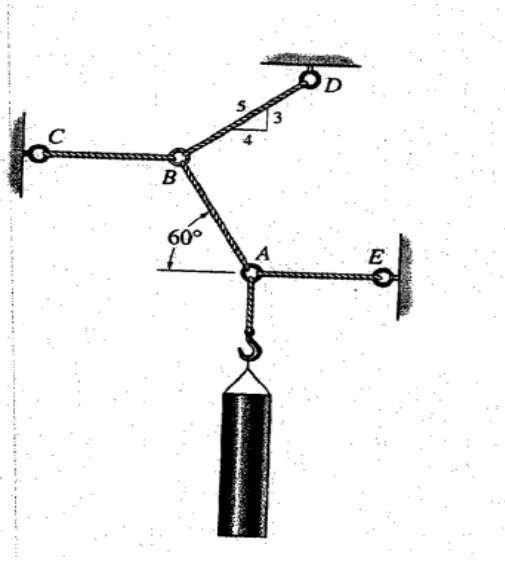

Figure Q1

Question 2

3–40.

The load has a mass of 15 kg and is lifted by the pulley system shown. Determine the force **F** in the cord as a function of the angle θ. Plot the function of force F versus the angle θ for $0 \leq \theta \leq 90°$.

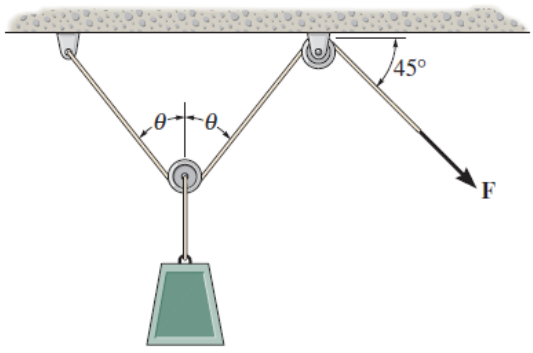

Figure Q2

Question 3

3–61. Determine the tension developed in cables AB, AC, and AD required for equilibrium of the 75-kg cylinder.

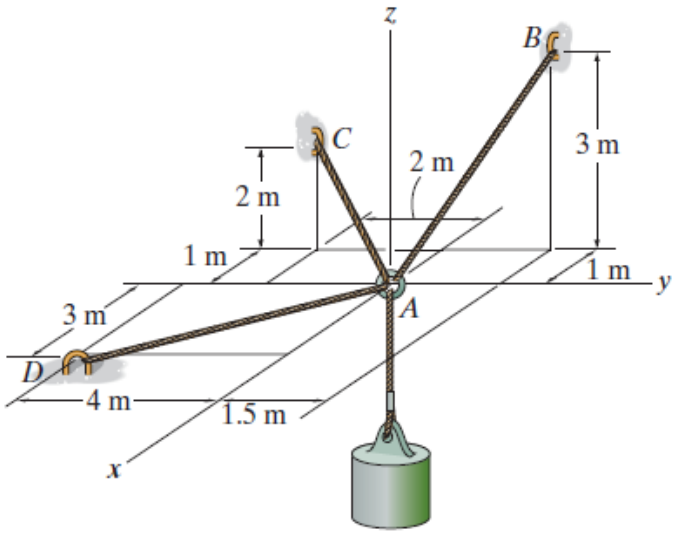

Figure Q3

Question 4

3–47.

Determine the stretch in each of the two springs required to hold the 20-kg crate in the equilibrium position shown. Each spring has an unstretched length of 2 m and a stiffness of $k = 300$ N/m.

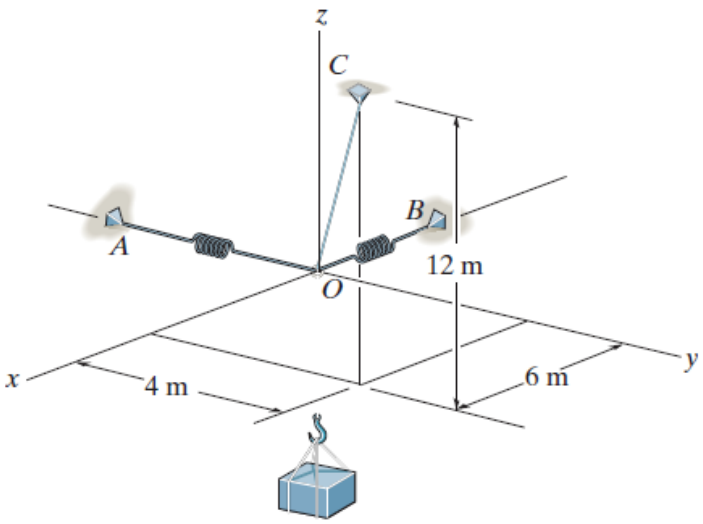

Figure Q4

Question 5

4–6.

The crane can be adjusted for any angle $0° \leq \theta \leq 90°$ and any extension $0 \leq x \leq 5\,\text{m}$. For a suspended mass of 120 kg, determine the moment developed at A as a function of x and θ. What values of both x and θ develop the maximum possible moment at A? Compute this moment. Neglect the size of the pulley at B.

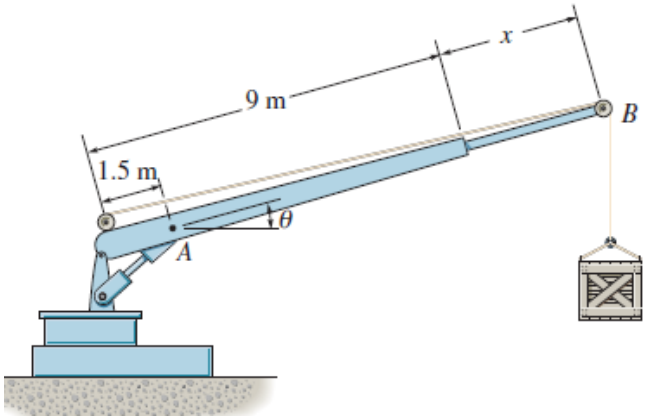

Figure Q5

Question 6

4–74.

If the valve can be opened with a couple moment of $25\,\text{N} \cdot \text{m}$, determine the required magnitude of each couple force which must be applied to the wheel.

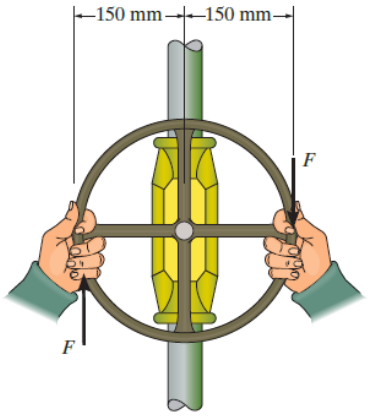

Figure Q6

Question 7

4–51. Determine the magnitude of the moment produced by the force of $F = 200$ N about the hinged axis (the x axis) of the door.

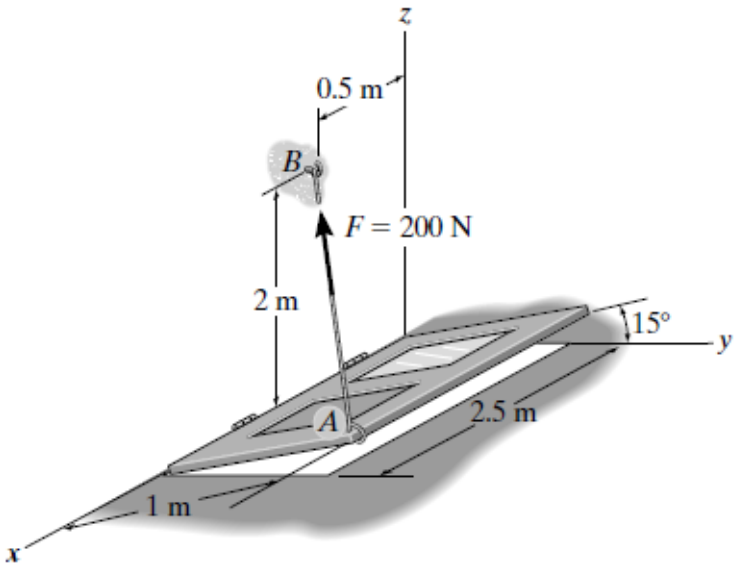

Figure Q7