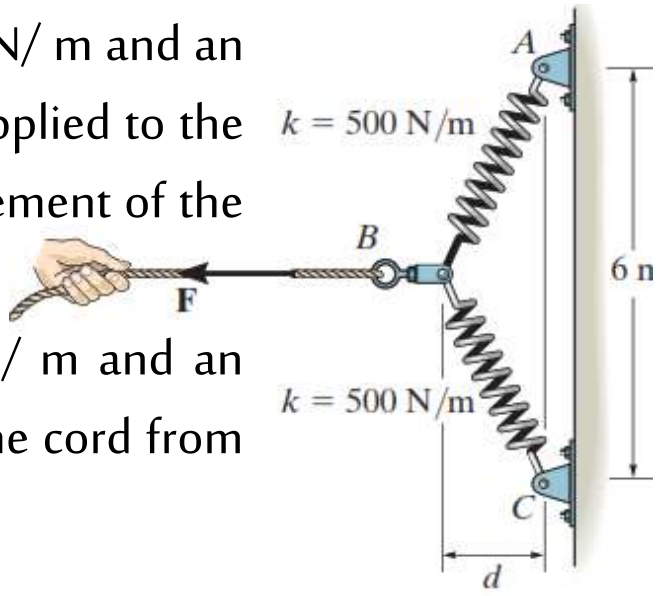
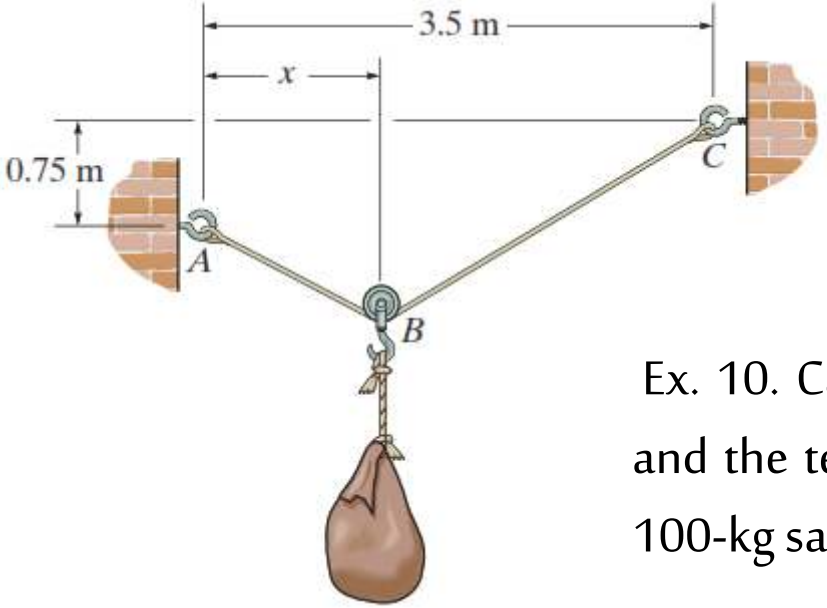
Ex.9. (1) The springs *BA* and *BC* each have a stiffness of 500 N/ m and an unstretched length of 3 m. Determine the horizontal force *F* applied to the cord which is attached to the small ring *B* so that the displacement of the ring from the wall is *d* = 1.5 m.

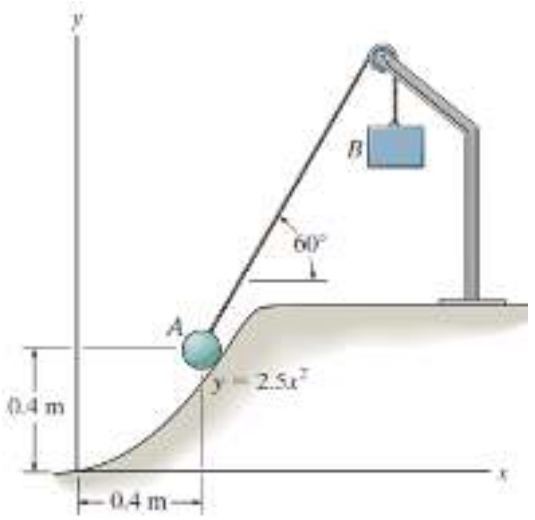


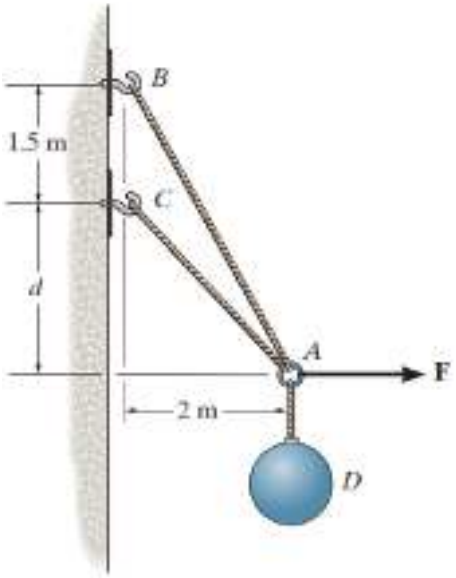
(2) The springs *BA* and *BC* each have a stiffness of 500 N/ m and an unstretched length of 3 m. Determine the displacement *d* of the cord from the wall when a force *F* = 175 N is applied to the cord.



Ex. 10. Cable *ABC* has a length of 5 m. Determine the position *x* and the tension developed in *ABC* required for equilibrium of the 100-kg sack. Neglect the size of the pulley at *B*.

Ex. 11. A 4-kg sphere rests on the smooth parabolic surface. Determin the normal force it exerts on the surface and the mass m_B of block needed to hold it in the equilibrium position shown.





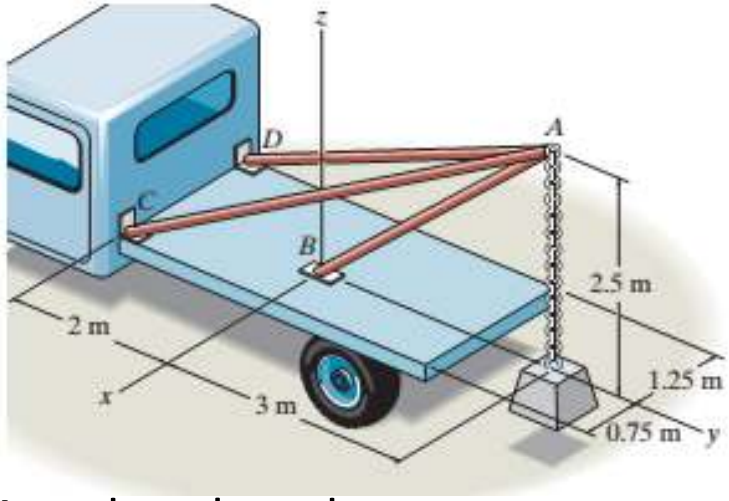
Ex. 12.

(1) Determine the forces in cables AC and AB needed to hold the 20-kg ball D in equilibrium. Take F = 300 N and d = 1 m.

(2) The ball D has a mass of 20 kg. If a force of F = 100 N is applied horizontally to the ring at A, determine the dimension d so that the force in cable AC is zero.

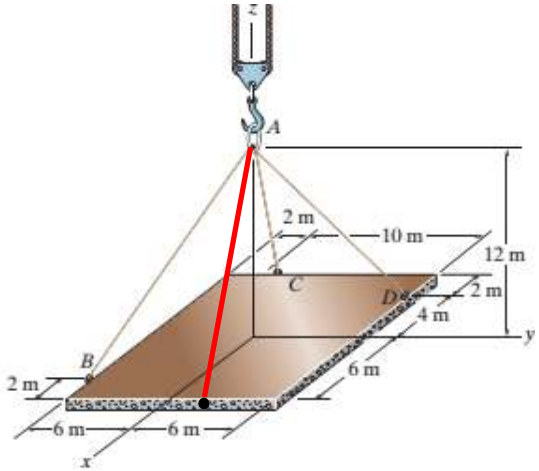
Example 2.

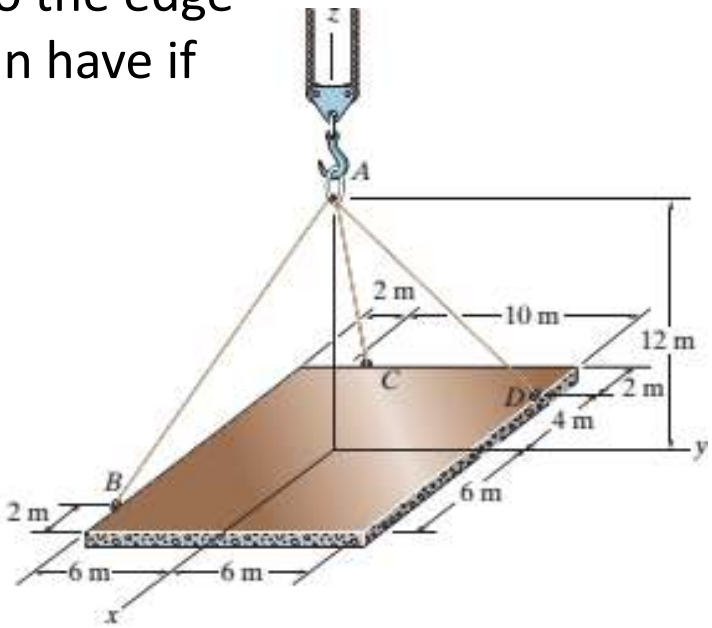
Determine the force acting along the axis of each of the three struts needed to support the 500-kg block



Example 3.

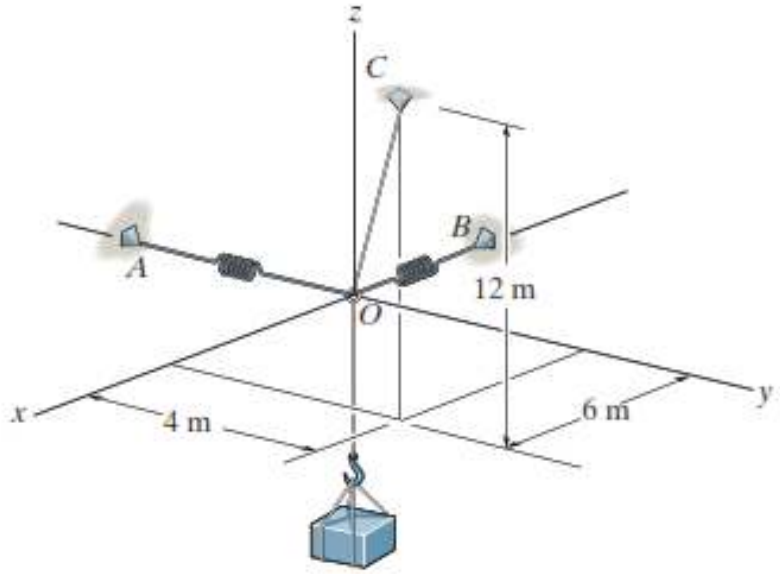
The ends of the three cables are attached to a ring at A and to the edge of the uniform plate. Determine the largest mass the plate can have if each cable can support a maximum tension of 15 kN.

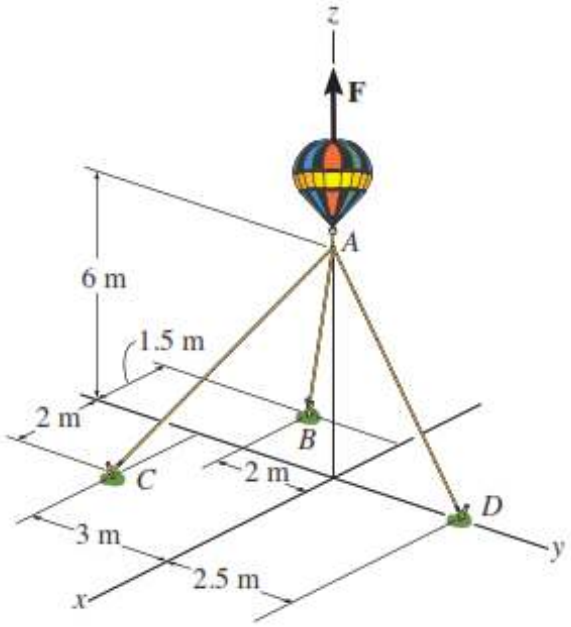




Example 4.

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.





Example 5.

(1) If the balloon is subjected to a net uplift force of F = 800 N, determine the tension developed in ropes AB , AC , AD .

(2) If each one of the ropes will break when it is subjected to a tensile force of 450 N, determine the maximum uplift force F the balloon can have before one of the ropes breaks.