GEN_ENG_205-2 – Engineering Analysis II

HOMEWORK#3

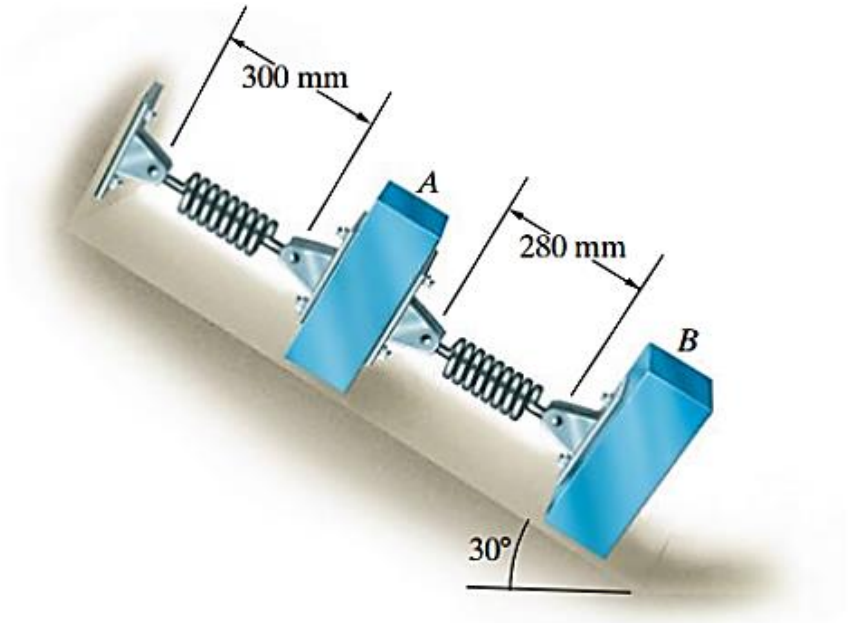
Problem No. 1.

3.5 A heavy rope used as a mooring line for a cruise ship sags as shown. If the mass of the rope is 90 kg, what are the tensions in the rope at A and B?

Problem 3.5

Problem No. 2.

3.9 The inclined surface is smooth. (Remember that "smooth" means that friction is negligible.) The two springs are identical, with unstretched lengths of 250 mm and spring constants $k = 1200$ N/m. What are the masses of blocks A and B?

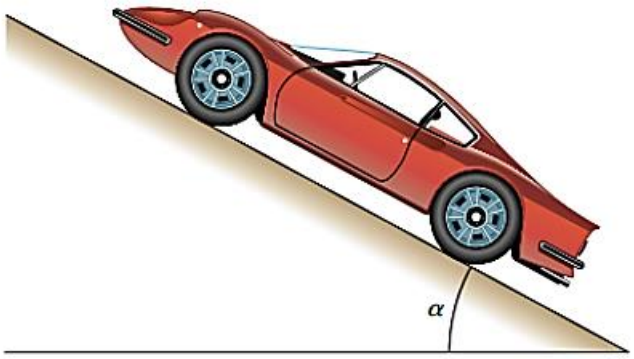


Problem No. 3.

3.12 The 1200-kg car is stationary on the sloping road.

(a) If $\alpha = 20°$, what are the magnitudes of the total normal and friction forces exerted on the car's tires by the road?

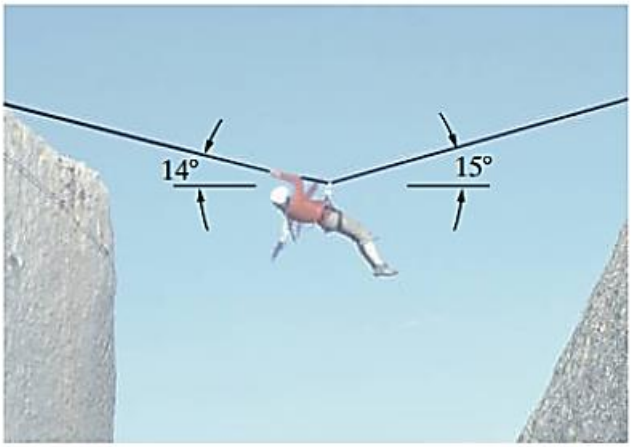
(b) The car can remain stationary only if the total friction force necessary for equilibrium is not greater than 0.6 times the total normal force. What is the largest angle α for which the car can remain stationary?



Problem 3.12

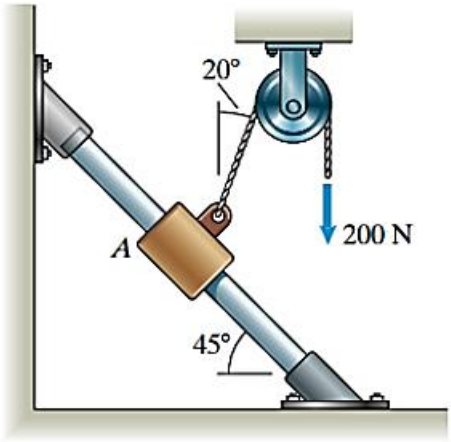
Problem No. 4.

3.20 Assume that the 150-lb climber is in equilibrium. What are the tensions in the rope on the left and right sides?



Problem No. 5.

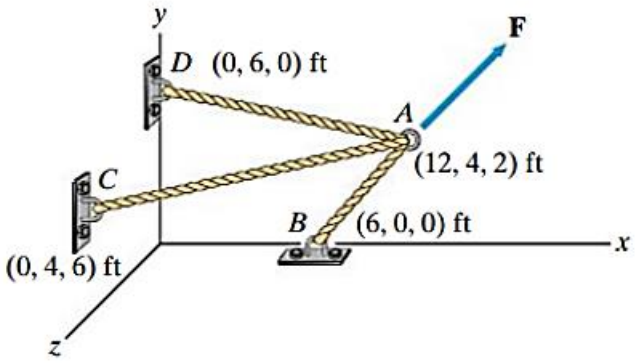
3.32 The slider A is in equilibrium and the bar is smooth. What is the mass of the slider?



Problem 3.32

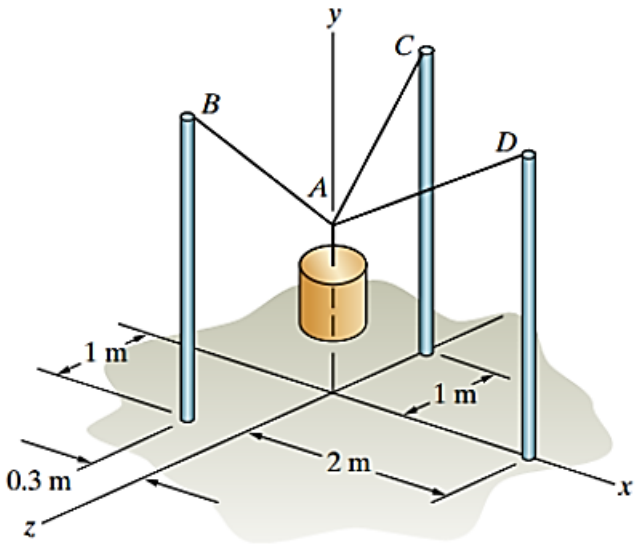
Problem No. 6.

3.64 The force $\mathbf{F} = 800\mathbf{i} + 200\mathbf{j}$ (lb) acts at point A where the cables AB, AC, and AD are joined. What are the tensions in the three cables?



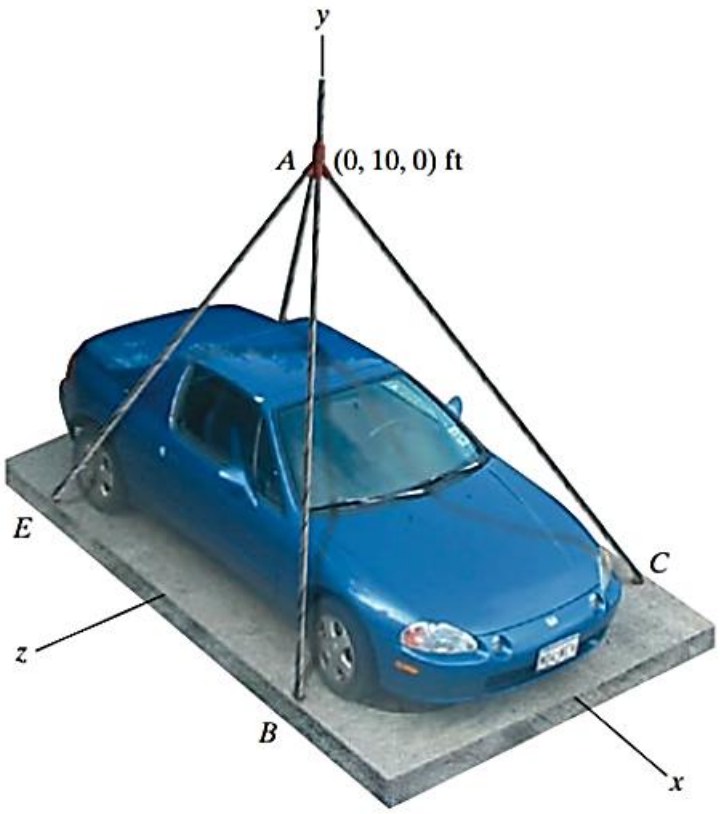
Problem No. 7.

3.69 The 20-kg mass is suspended by cables attached to three vertical 2-m posts. Point A is at (0, 1.2, 0) m. Determine the tensions in cables AB, AC, and AD.

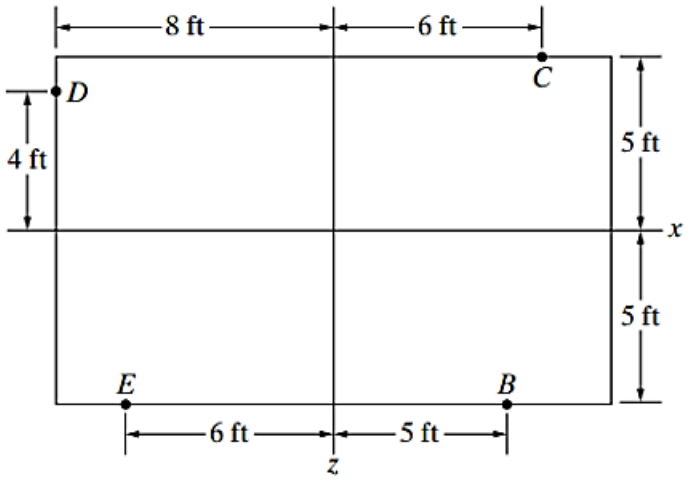


Problem No. 8.

3.71 The car in Fig. a and the pallet supporting it weigh 3000 lb. They are supported by four cables *AB*, *AC*, *AD*, and *AE*. The locations of the attachment points on the pallet are shown in Fig. b. The tensions in cables *AB* and *AE* are equal. Determine the tensions in the cables.



(a)



(b)