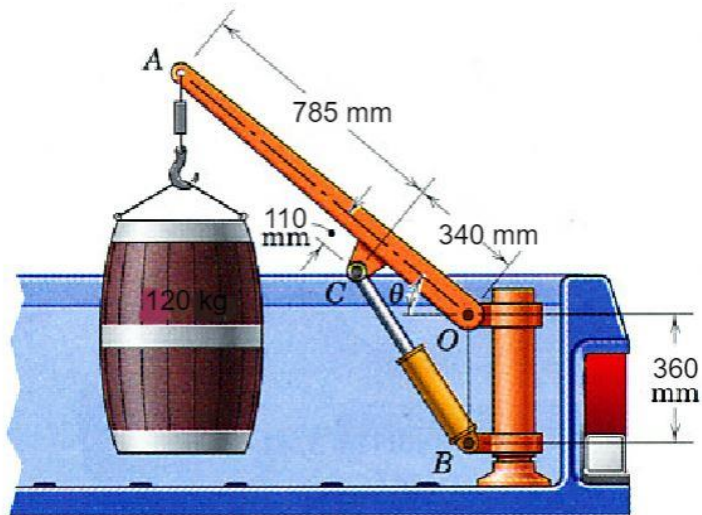


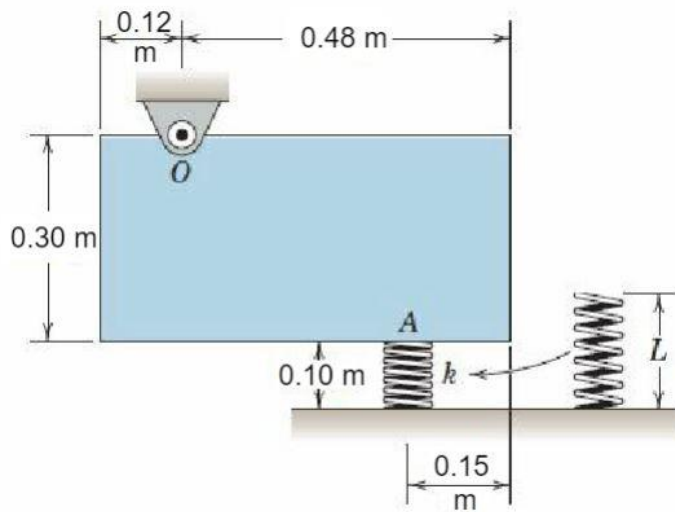
Chapter 3, Practice Problem 3/07

The small crane is mounted on one side of the bed of a pickup truck. For the position $\theta = 40^\circ$, determine the magnitude of the force supported by the pin at O and the oil pressure p against the 50-mm-diameter piston of the hydraulic cylinder BC .



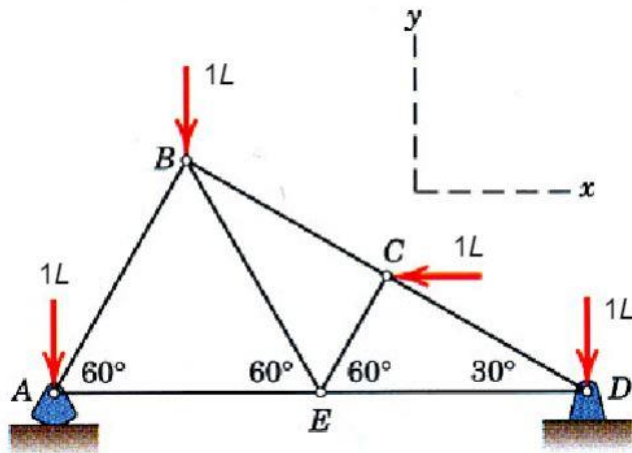
Chapter 3, Problem 3/011

The 20-kg uniform rectangular plate is supported by an ideal pivot at O and a spring which must be compressed prior to being slipped into place at point A . If the modulus of the spring is $k = 2.0 \text{ kN/m}$, what must be its undeformed length L ?



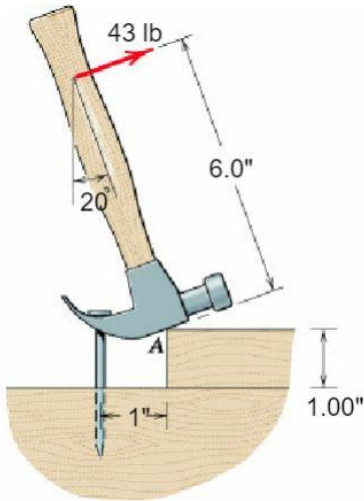
Chapter 3, Problem 3/035 (video solution to similar problem attached)

The asymmetric simple truss is loaded as shown. Determine the reactions at A and D . Neglect the weight of the structure compared with the applied loads. Is the knowledge of the size of the structure necessary?



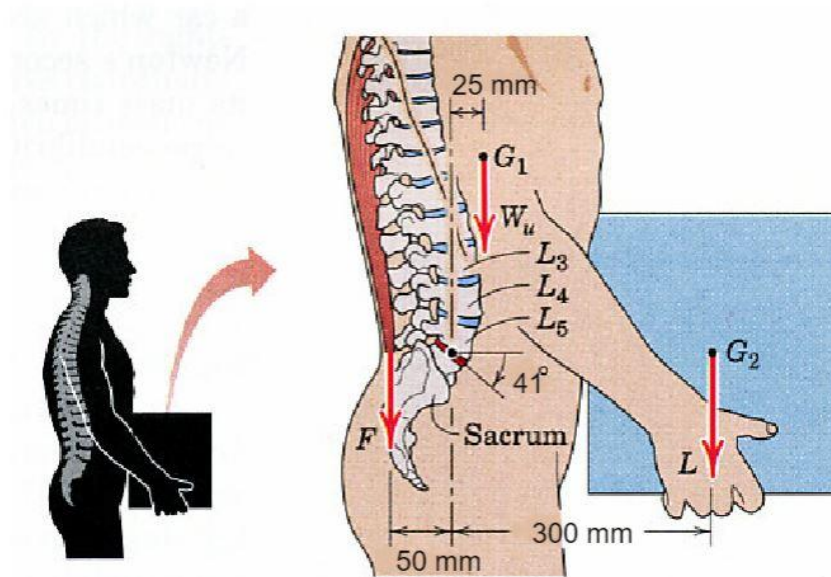
Chapter 3, Problem 3/040 (video solution to similar problem attached)

A block placed under the head of the claw hammer as shown greatly facilitates the extraction of the nail. If a 43-lb pull on the handle is required to pull the nail, calculate the tension T in the nail and the magnitude A of the force exerted by the hammer head on the block. The contacting surfaces at A are sufficiently rough to prevent slipping.



Chapter 3, Problem 3/059

The lumbar portion of the human spine supports the entire weight of the upper torso and the force load imposed on it. We consider here the disk (shaded red) between the lowest vertebra of the lumbar region (L_5) and the uppermost vertebra of the sacrum region. (a) For the case $L = 0$, determine the compressive force C and the shear force S supported by this disk in terms of the body weight W . The weight W_u of the upper torso (above the disk in question) is 68% of the total body weight W and acts at G_1 . The vertical force F which the rectus muscles of the back exert on the upper torso acts as shown in the figure. (b) Repeat for case when the person holds a weight of magnitude $L = 0.33W$ as shown. State any assumptions.



Chapter 3, Problem 3/041

The uniform slender bar of length $2.00r$ and mass m rests against the circular surface as shown. Determine the normal force at the small roller A and the magnitude of the ideal pivot reaction at O .

