

PROBLEM 4.97

Two steel pipes AB and BC , each having a mass per unit length of 8 kg/m , are welded together at B and supported by three wires. Knowing that $a = 0.4 \text{ m}$, determine the tension in each wire.

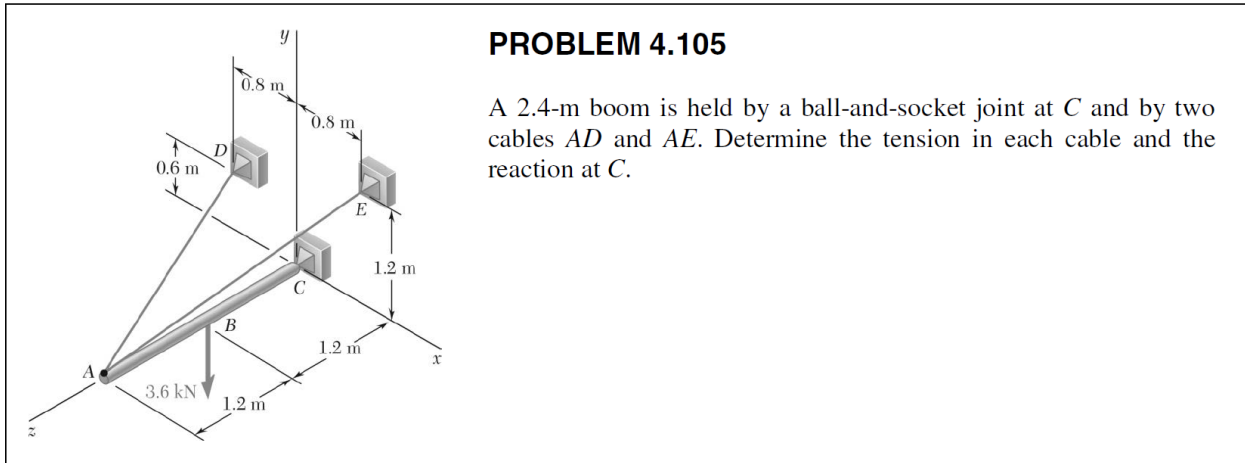
Ans. $T_A = 23.5 \text{ N}$, $T_B = 11.77 \text{ N}$, $T_C = 105.9 \text{ N}$

The diagram shows a square plate in a 3D coordinate system with x, y, and z axes. The plate is shaded gray. Point A is at the bottom-left corner (0,0,0). Point B is at the bottom-right corner (20,0,0). Point C is on the left edge, 5 inches from the bottom-left corner along the y-axis. The plate's side length is 20 inches. Three vertical wires support the plate at points A, B, and C. Dimensions are given: 20 in. for the side length, 5 in. for the distance from A to C along the y-axis, and 15 in. for the distance from C to the back edge along the y-axis. The z-axis is perpendicular to the xy-plane.

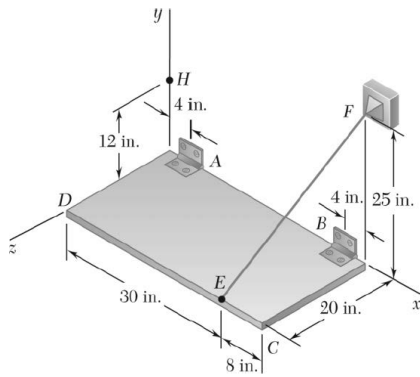
PROBLEM 4.99

The 45-lb square plate shown is supported by three vertical wires. Determine the tension in each wire.

Ans. $T_A = 5.63 \text{ lb}$, $T_B = 16.88 \text{ lb}$, $T_C = 22.50 \text{ lb}$



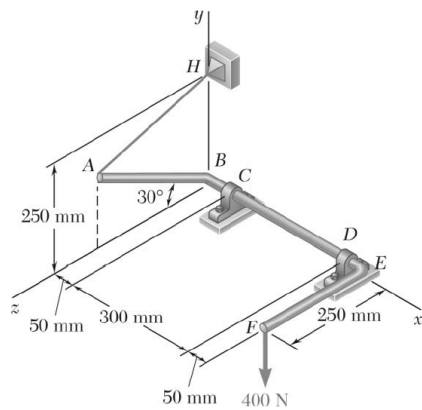
Ans. $T_{AE} = 2.80$ kN



PROBLEM 4.115

The rectangular plate shown weighs 75 lb and is held in the position shown by hinges at A and B and by cable EF . Assuming that the hinge at B does not exert any axial thrust, determine (a) the tension in the cable, (b) the reactions at A and B .

Ans. (a) $T = 49.5$ lb (b) $\mathbf{A} = -12.0\mathbf{i} + 22.5\mathbf{j} - 4.0\mathbf{k}$ lb, $\mathbf{B} = 15.0\mathbf{j} + 34.0\mathbf{k}$ lb



PROBLEM 4.118

The bent rod $ABEF$ is supported by bearings at C and D and by wire AH . Knowing that portion AB of the rod is 250 mm long, determine (a) the tension in wire AH , (b) the reactions at C and D . Assume that the bearing at D does not exert any axial thrust.

Ans. $T = 462 \text{ N}$

