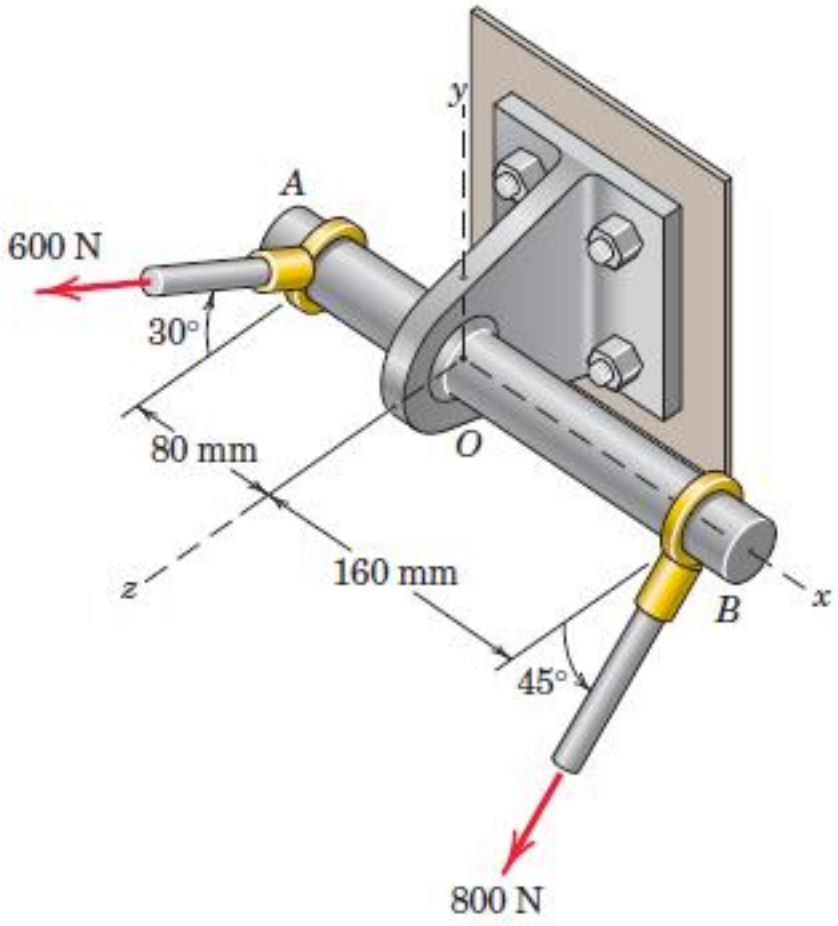
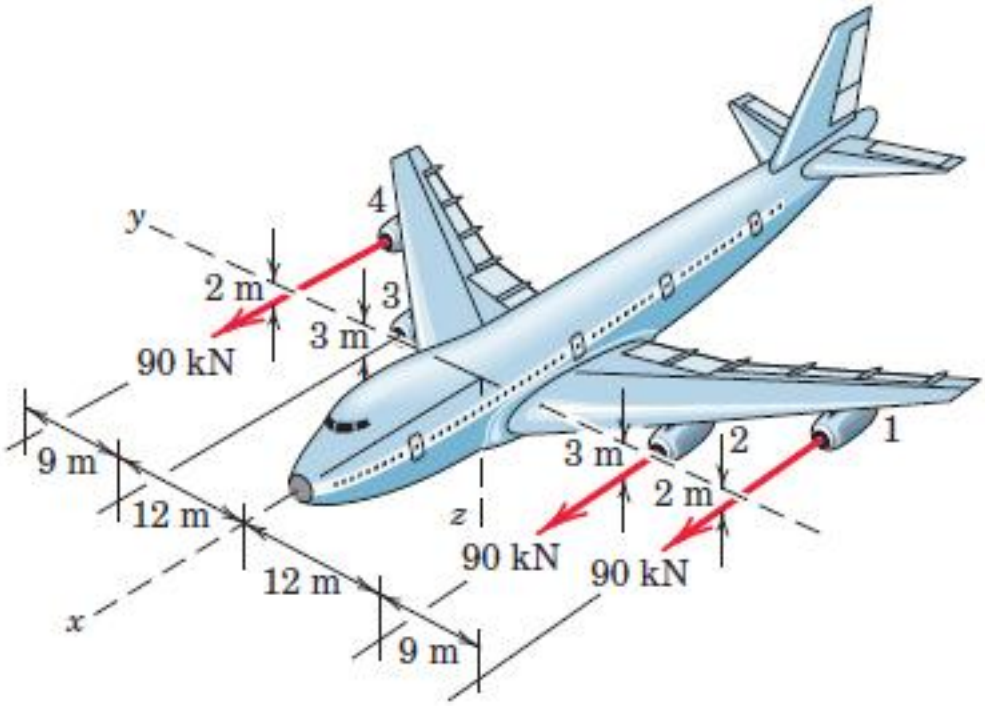
1. Chapter 2, Problem 2/156

Determine the force-couple system at *O* which is equivalent to the two forces applied to the shaft *AOB*. Is **R** perpendicular to $\mathbf{M}_O$?



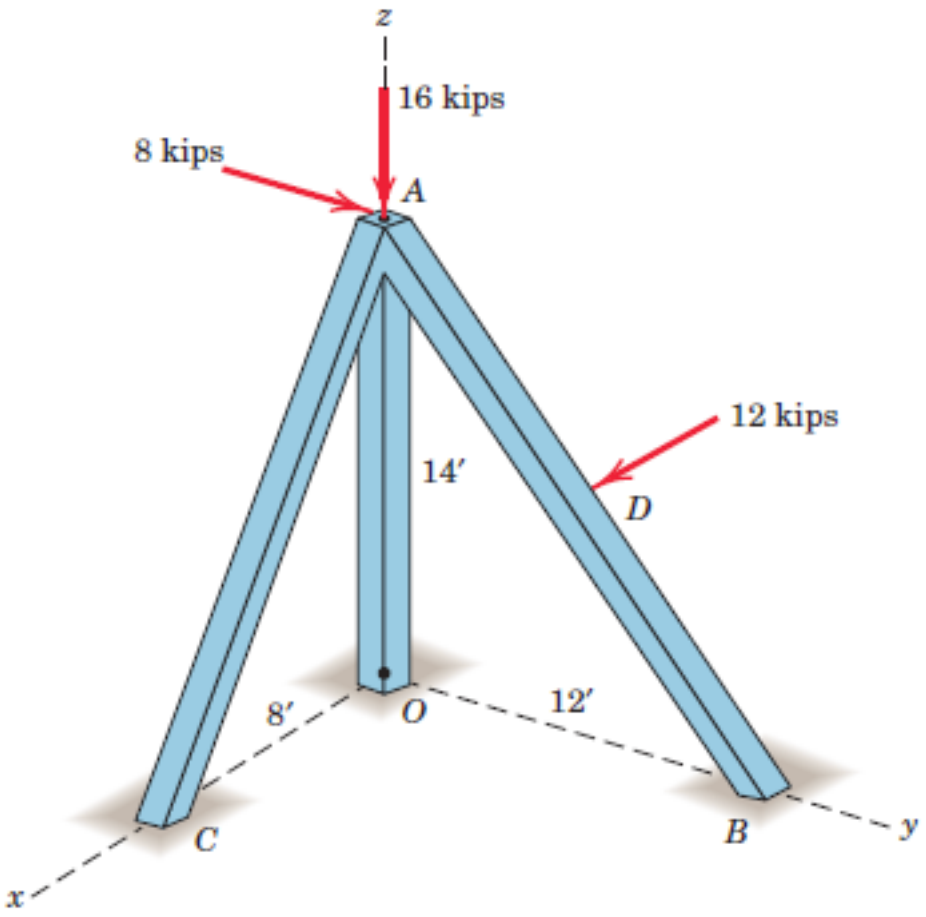
2. Chapter 2, Problem 2/159

A commercial airliner is shown on the figure with three-dimensional information supplied. If engine 3 suddenly fails, determine the resultant (single equivalent force) of the three remaining engine thrust vectors, each of which has a magnitude of 90 kN. Specify the *y*- and *z*-coordinates of the point through which the line of action of the resultant passes. This information would be critical to the design criteria of performance with engine failure.



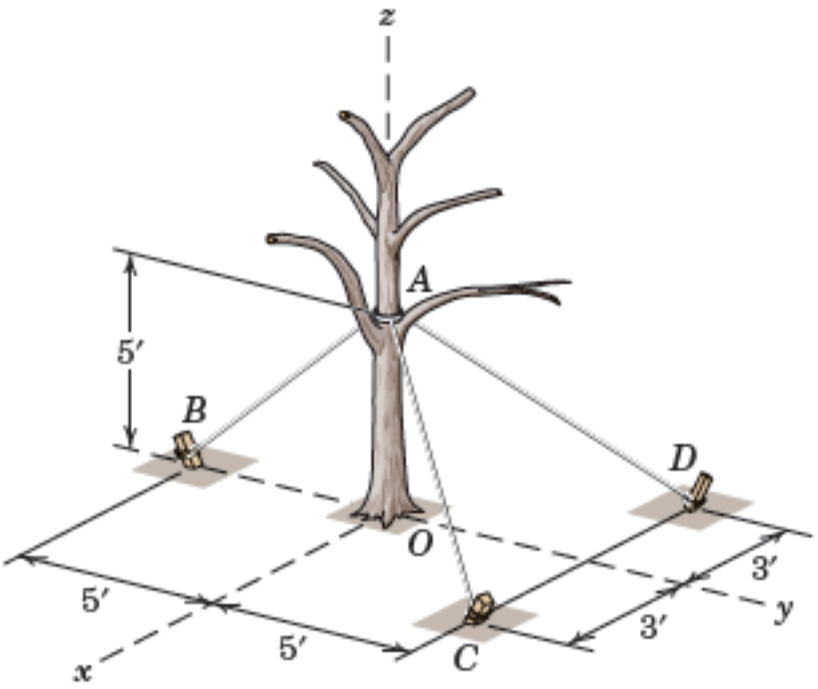
3. Chapter 2, Problem 2/163

Replace the three forces acting on the structural support with a wrench. Specify the coordinates of point *P* in the *x*-*y* plane through which the line of action of the wrench passes. Note that the 12-kip force is applied at the midpoint of member *AB* and lies parallel to the *x*-direction. Illustrate the wrench moment and resultant in an appropriate sketch.



4. Chapter 3, Practice Problem 3/09

The young tree, originally bent, has been brought into the vertical position by adjusting the three guy-wire tensions to *AB* = 0 lb, *AC* = 10 lb, and *AD* = 15 lb. Determine the force and moment reactions at the trunk base point *O*. Neglect the weight of the tree.



5. Chapter 3, Problem 3/075

One of the smooth vertical walls supporting end *B* of the 200-kg uniform shaft is turned through a 30° angle as shown here. End *A* is supported by the ball-and-socket connection in the horizontal *x*-*y* plane. Calculate the magnitudes of the forces *P* and *R* exerted on the ball end *B* of the shaft by the vertical walls *C* and *D*, respectively.

Note: The bar is slender (no rotation about its axis)