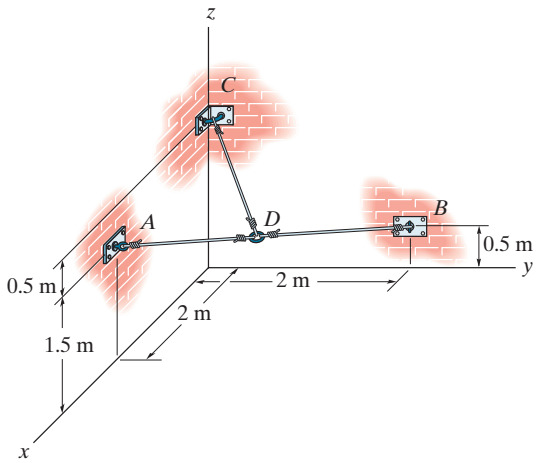
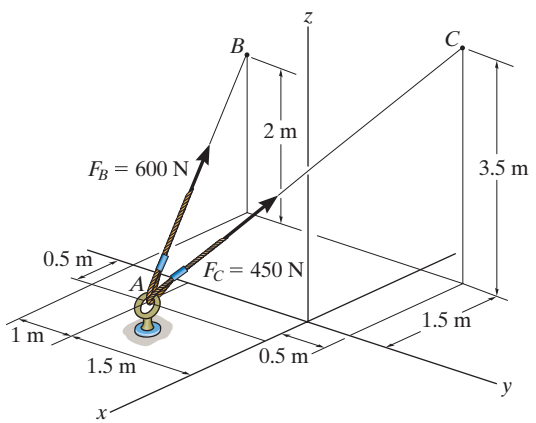
PROBLEMS

2–86. Determine the lengths of wires AD, BD, and CD. The ring at D is midway between A and B.



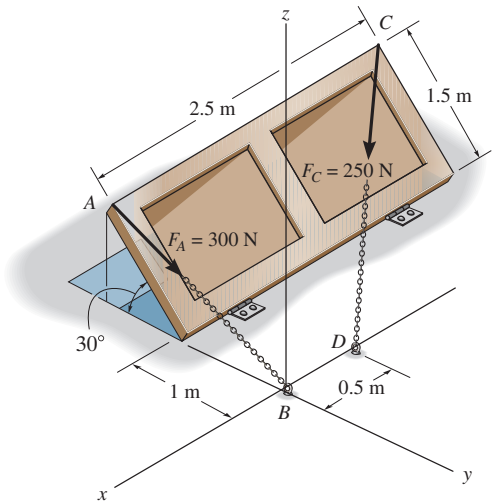
Prob. 2–86

2–87. Determine the magnitude and coordinate direction angles of the resultant force acting at A.



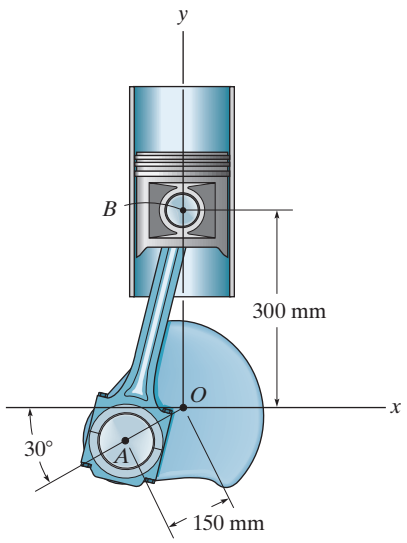
Prob. 2–87

***2–88.** The door is held opened by means of two chains. If the tension in AB and CD is $\mathbf{F}_A = 300$ N and $\mathbf{F}_C = 250$ N, respectively, express each of these forces in Cartesian vector form.



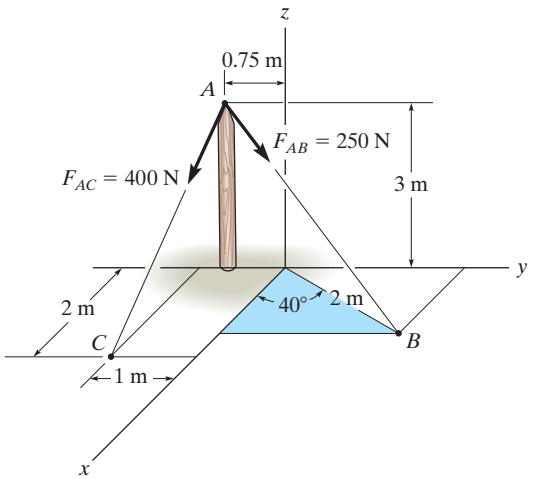
Prob. 2–88

2–89. Determine the length of the connecting rod AB by first formulating a position vector from A to B and then determining its magnitude.



Prob. 2–89

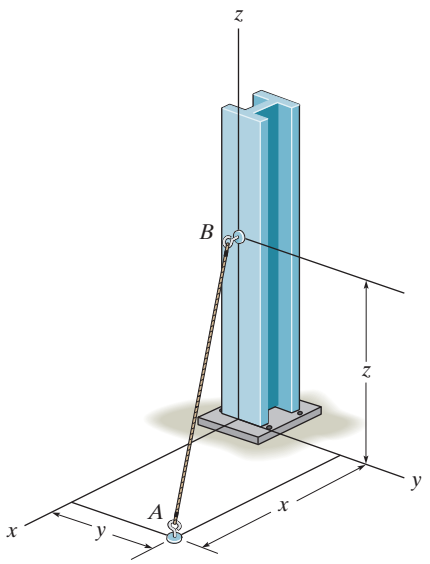
2–90. Determine the magnitude and coordinate direction angles of the resultant force.



Prob. 2–90

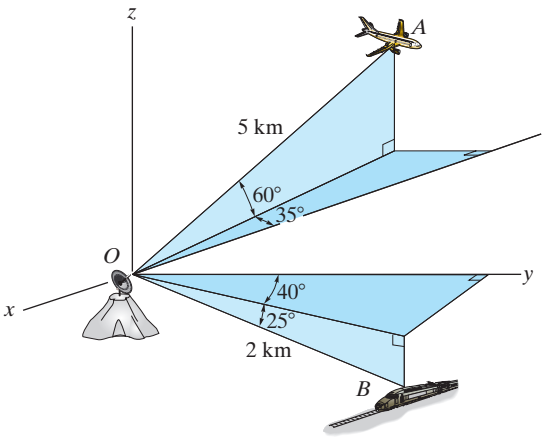
2–91. The 8-m-long cable is anchored to the ground at A. If $x = 4$ m and $y = 2$ m, determine the coordinate z to the highest point of attachment along the column.

***2–92.** The 8-m-long cable is anchored to the ground at A. If $z = 5$ m, determine the location $+x, +y$ of the support at A. Choose a value such that $x = y$.



Probs. 2–91/92

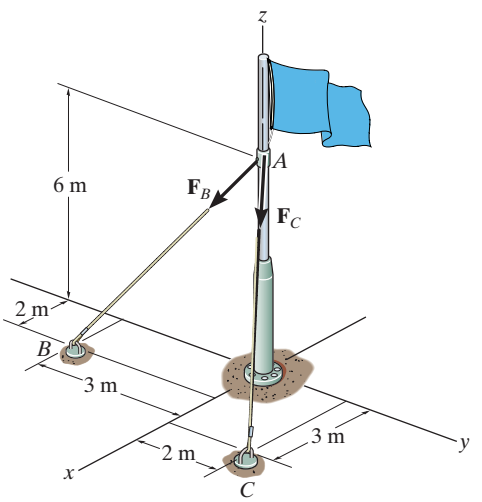
2–93. At a given instant, the position of a plane at A and a train at B are measured relative to a radar antenna at O. Determine the distance d between A and B at this instant. To solve the problem, formulate a position vector, directed from A to B, and then determine its magnitude.



Prob. 2–93

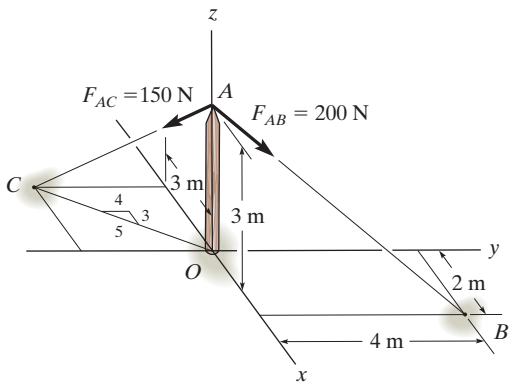
2–94. If $F_B = 560$ N and $F_C = 700$ N, determine the magnitude and coordinate direction angles of the resultant force acting on the flag pole.

2–95. If $F_B = 700$ N, and $F_C = 560$ N, determine the magnitude and coordinate direction angles of the resultant force acting on the flag pole.



Probs. 2–94/95

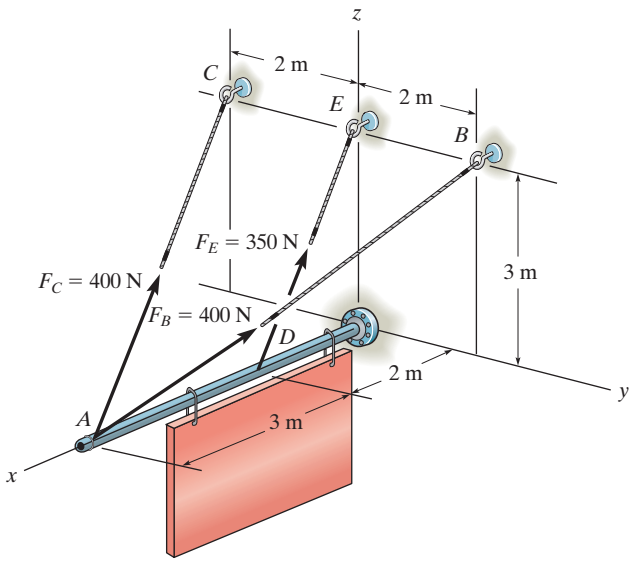
***2–96.** Determine the magnitude and coordinate direction angles of the resultant force acting at point A on the post.



Probs. 2–96

2–97. Represent each cable force as a Cartesian vector.

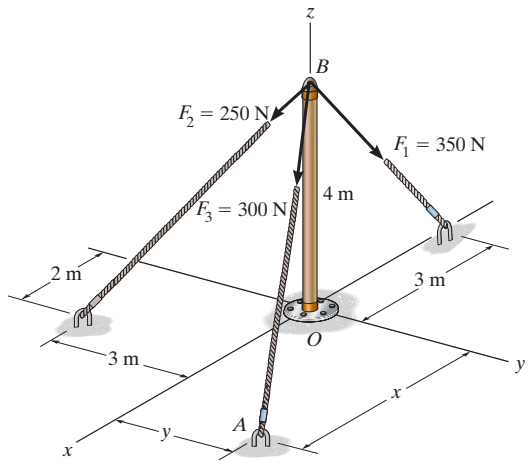
2–98. Determine the magnitude and coordinate direction angles of the resultant of the two forces acting at point A.



Probs. 2–97/98

2–99. Determine the position $(x, y, 0)$ for fixing cable BA so that the resultant force exerted on the pole is directed along its axis, from B toward O. Also, what is the magnitude of the resultant force?

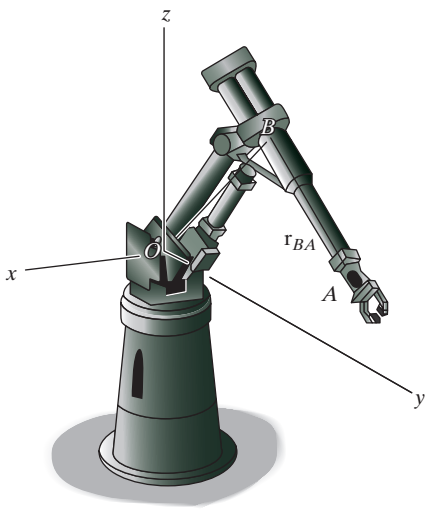
***2–100.** Determine the magnitude and coordinate direction angles α, β, γ of the resultant force acting on the pole. Set $x = 4$ m, $y = 2$ m.



Probs. 2–99/100

2–101. Position vectors along the robotic arm from O to B and B to A are $\mathbf{r}_{OB} = \{100\mathbf{i} + 300\mathbf{j} + 400\mathbf{k}\}$ mm and $\mathbf{r}_{BA} = \{350\mathbf{i} + 225\mathbf{j} - 640\mathbf{k}\}$ mm, respectively. Determine the distance from O to the grip at A.

2–102. If $\mathbf{r}_{OA} = \{0.5\mathbf{i} + 4\mathbf{j} + 0.25\mathbf{k}\}$ m and $\mathbf{r}_{OB} = \{0.3\mathbf{i} + 2\mathbf{j} + 2\mathbf{k}\}$ m, express $\mathbf{r}_{BA}$ as a Cartesian vector.



Probs. 2–101/102