

### Problems # 3

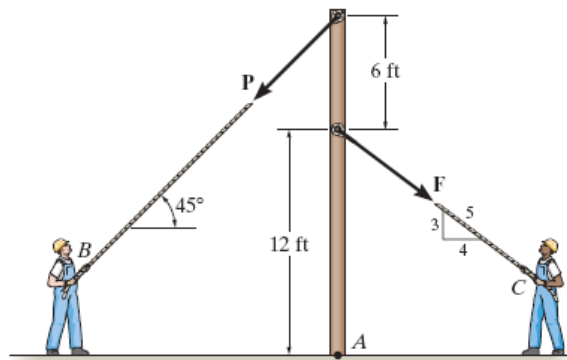
**Topics**

Force System Resultants (Chapter 4 in textbook).

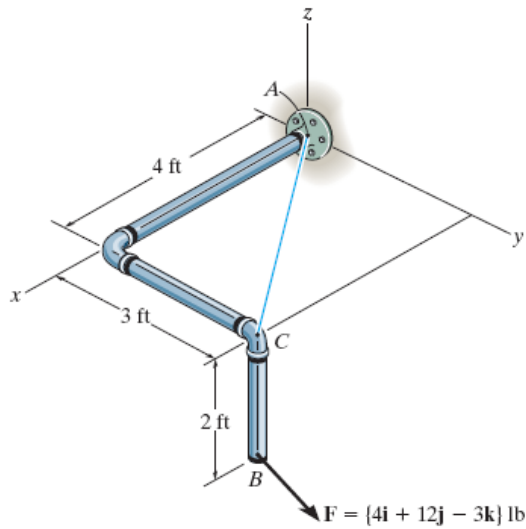
**Textbook:**

Engineering Mechanics, by R.C. Hibbeler, Pearson, 12th Edition.

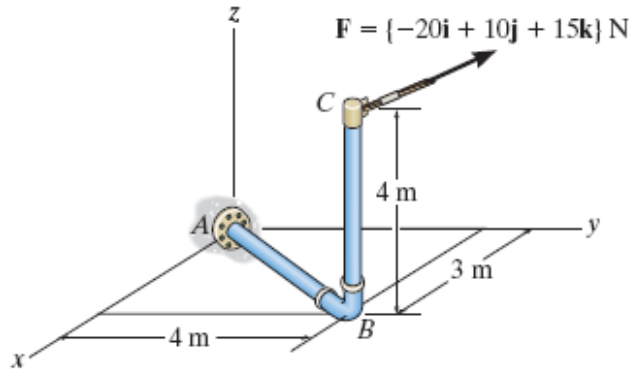
\*4-4. Two men exert forces of  $F=80\text{lb}$  and  $P=50\text{lb}$  on the ropes. Determine the moment of each force about A. Which way will the pole rotate, clockwise or counterclockwise?



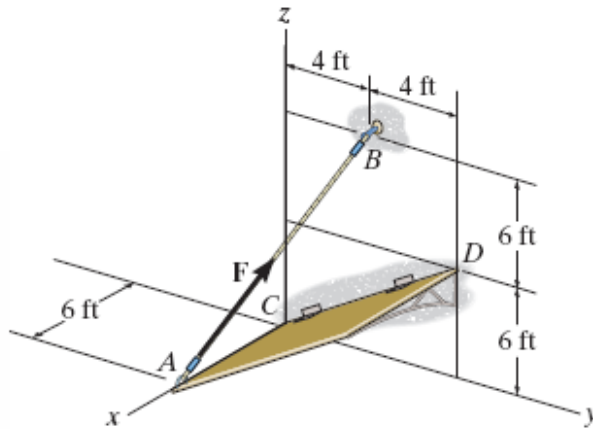
4-54. Determine the magnitude of the moments of the force  $F$  about the  $x$ ,  $y$ , and  $z$  axes. Solve the problem (a) using a Cartesian vector approach and (b) using a scalar approach.



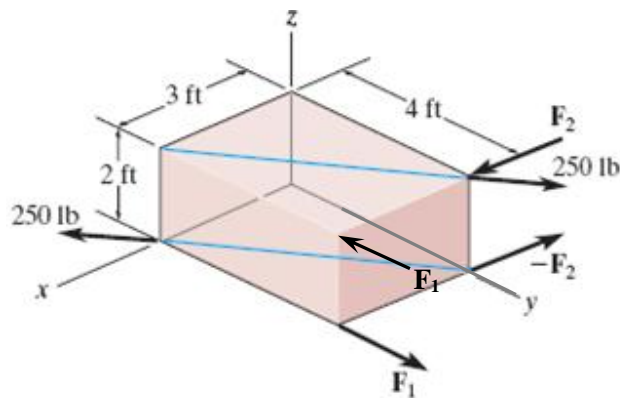
\*4-56. Determine the moment produced by force  $\mathbf{F}$  about segment  $AB$  of the pipe assembly.



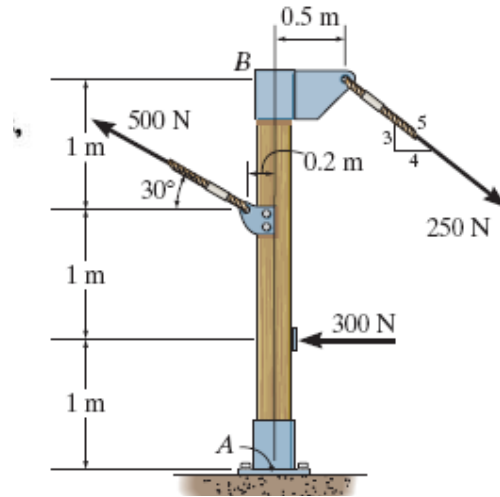
•4-61. If the tension in the cable is  $F=140 \text{ lb}$ , determine the magnitude of the moment produced by this force about the hinged axis,  $CD$ , of the panel.



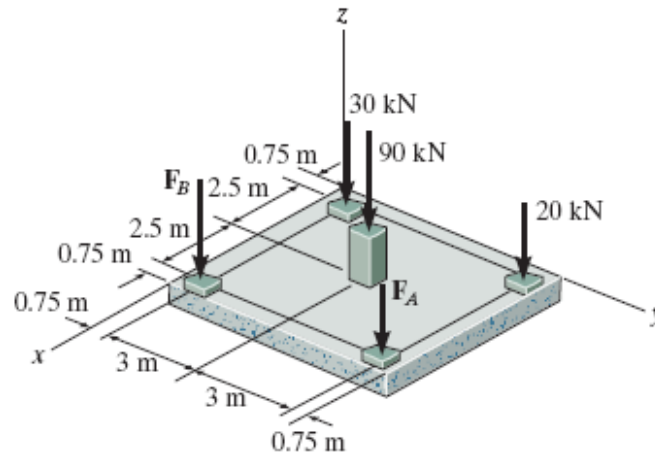
4-103. Determine the magnitude of couple forces  $\mathbf{F}_1$  and  $\mathbf{F}_2$  so that the resultant couple moment acting on the block is zero.



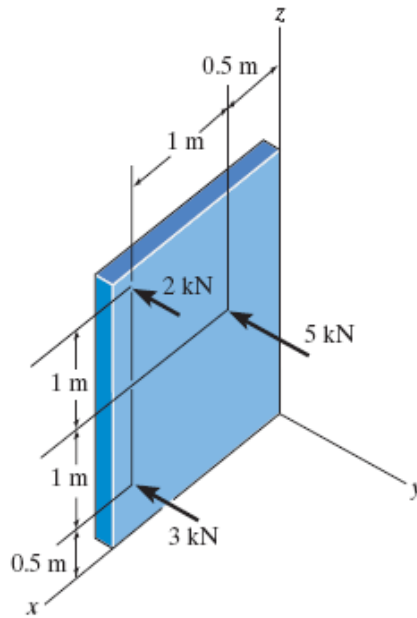
- 4-109. Replace the force system acting on the post by a resultant force and couple moment at point A.



- 4-134. If,  $F_A = 40$  kN and  $F_B = 35$  kN, determine the magnitude of the resultant force and specify the location of its point of application ( $x, y$ ) on the slab.



**\*4-136.** Replace the parallel force system acting on the plate by a resultant force and specify its location on the  $x$ - $z$  plane.



**4-150.** The beam is subjected to the distributed loading. Determine the length  $b$  of the uniform load and its position  $a$  on the beam such that the resultant force and couple moment acting on the beam are zero.

