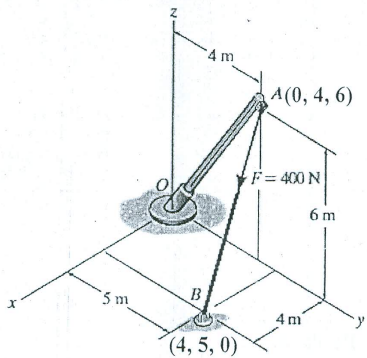


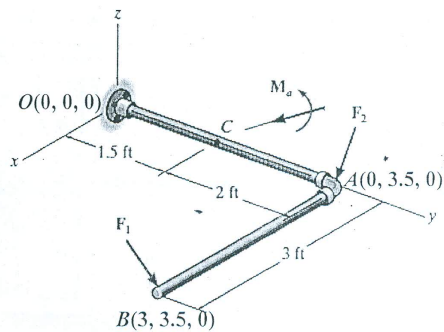
Prob. 1

1- Determine the magnitude of the force F_4 required to keep equilibrium. (10 Marks)

2- Determine: (1) The angle between the force F ($F = 219.8 i + 54.9 j - 329.7 k$) and the line AO (from point A to point O), and (2) the components of the force acting parallel ($F_{||}$) and perpendicular (F_{\perp}) to the line AO . (7 Marks)

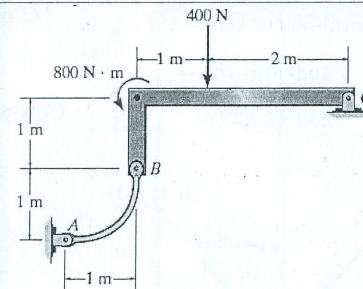


Prob. 2



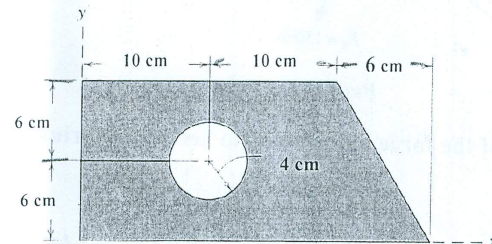
Prob. 3

3- If $F_1 = -4 i + 1 j - 2 k$ Ib, $F_2 = 2 i + 0 j - 4 k$ Ib and $M_a = 21 i - 6 j - 10 k$ Ib.ft, determine the equivalent force - couple system ($F_R - M_R$) at point $O(0, 0, 0)$. (8 Marks)



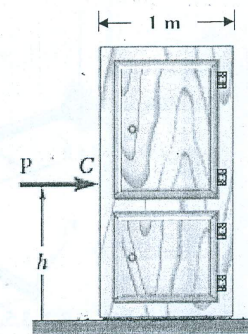
Prob. 4

4- The beam BC is supported by a pin at C and two-force member AB . Determine the reactions at the pin support C . (7 Marks)



Prob. 5

5- Determine the centroid coordinates (\bar{x}, \bar{y}) of the shaded area. (9 marks)



Prob. 6

6- The uniform crate shown has a weight of 500 N, the force $P = 200$ N and $h = 1.5$ m. The coefficient of static friction is $\mu_s = 0.5$. Determine if it remains in equilibrium.

(9 Marks) 2/2