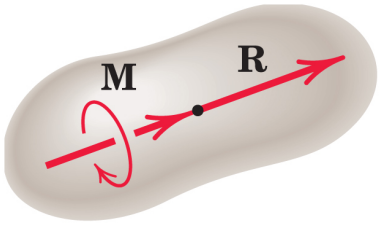
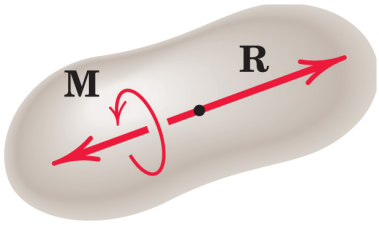
ENGG 202
Feb 13 Week 6

Problems

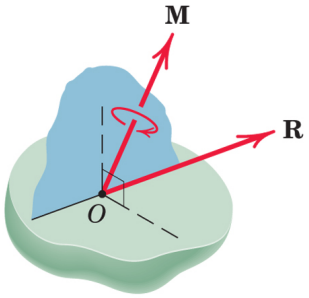
2/9 RESULTANTS



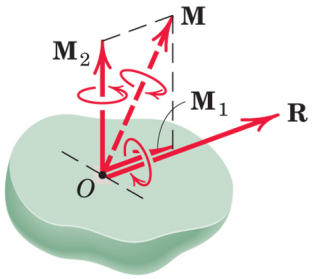
Positive wrench



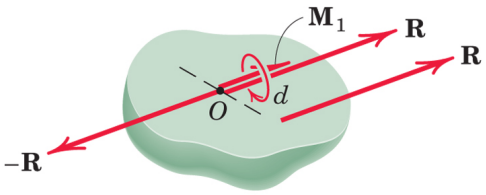
Negative wrench



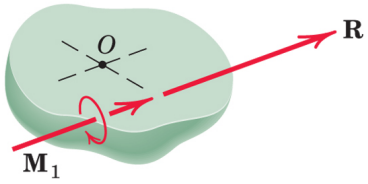
(a)



(b)



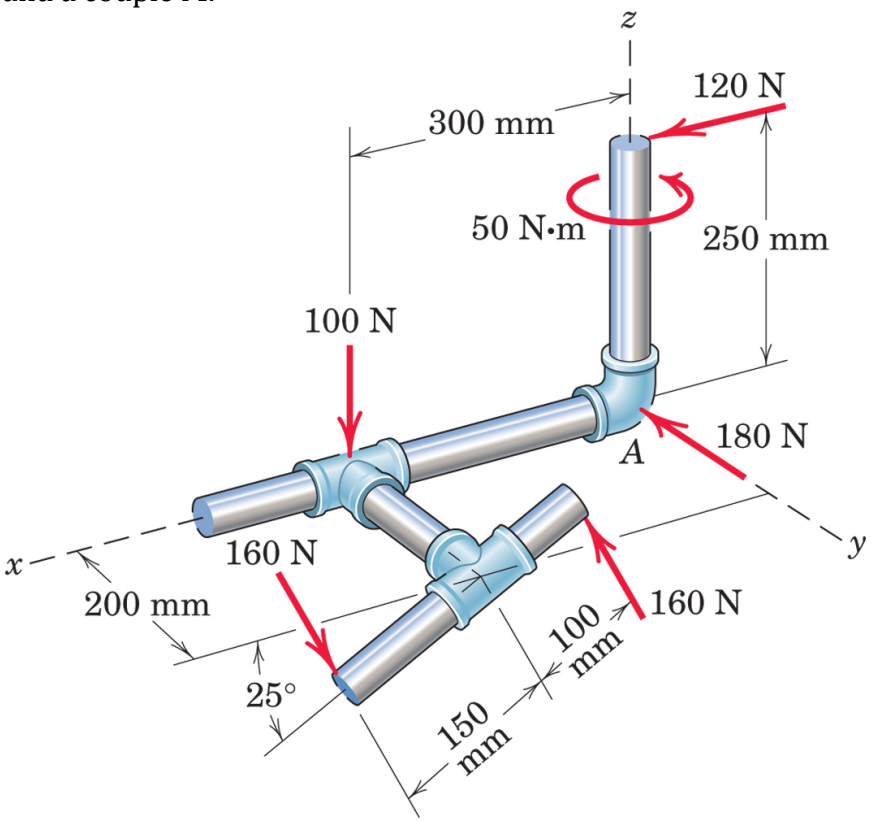
(c)



(d)

Problem 2/155

Represent the resultant of the force system acting on the pipe assembly by a single force **R** at A and a couple **M**.



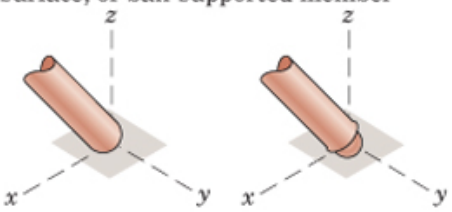
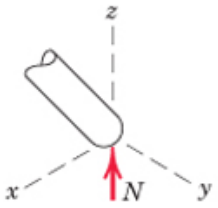
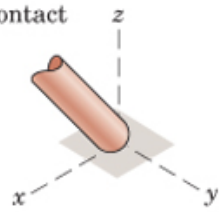
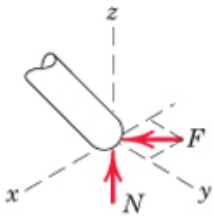
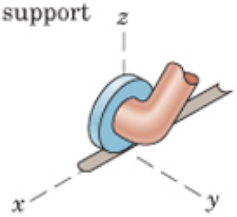
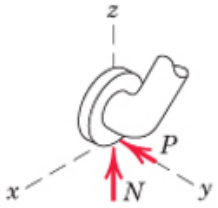
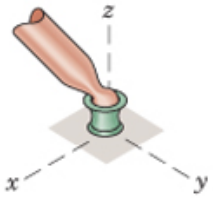
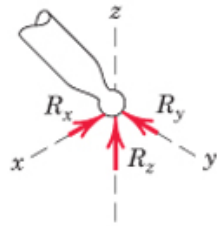
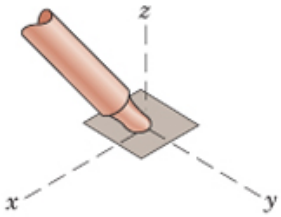
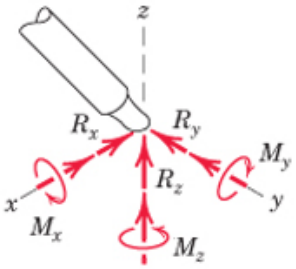
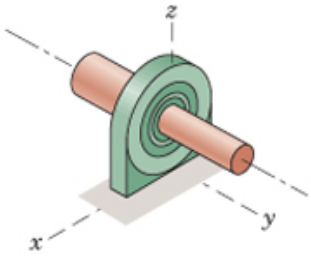
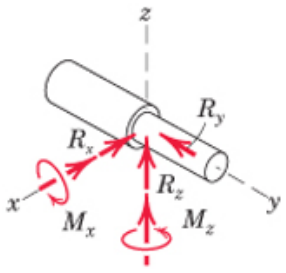
3/4 EQUILIBRIUM CONDTIONS in 3D

$$\Sigma \mathbf{F} = \mathbf{0} \qquad \text{or} \qquad \begin{cases} \Sigma F_x = 0 \\ \Sigma F_y = 0 \\ \Sigma F_z = 0 \end{cases}$$

$$\Sigma \mathbf{M} = \mathbf{0} \qquad \text{or} \qquad \begin{cases} \Sigma M_x = 0 \\ \Sigma M_y = 0 \\ \Sigma M_z = 0 \end{cases}$$

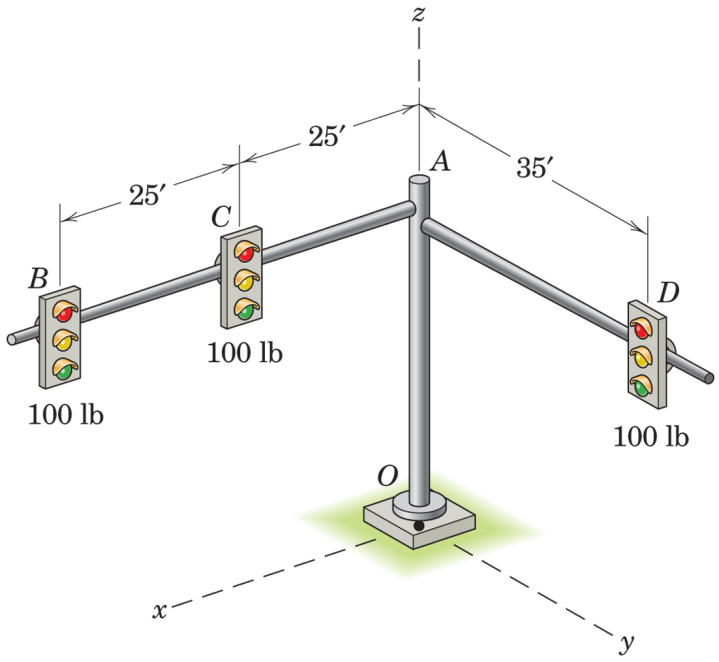
(3/3)

Three-dimensional supports

1. Member in contact with smooth surface, or ball-supported member 	
2. Member in contact with rough surface 	
3. Roller or wheel support with lateral constraint 	
4. Ball-and-socket joint 	
5. Fixed connection (embedded or welded) 	
6. Thrust-bearing support 	

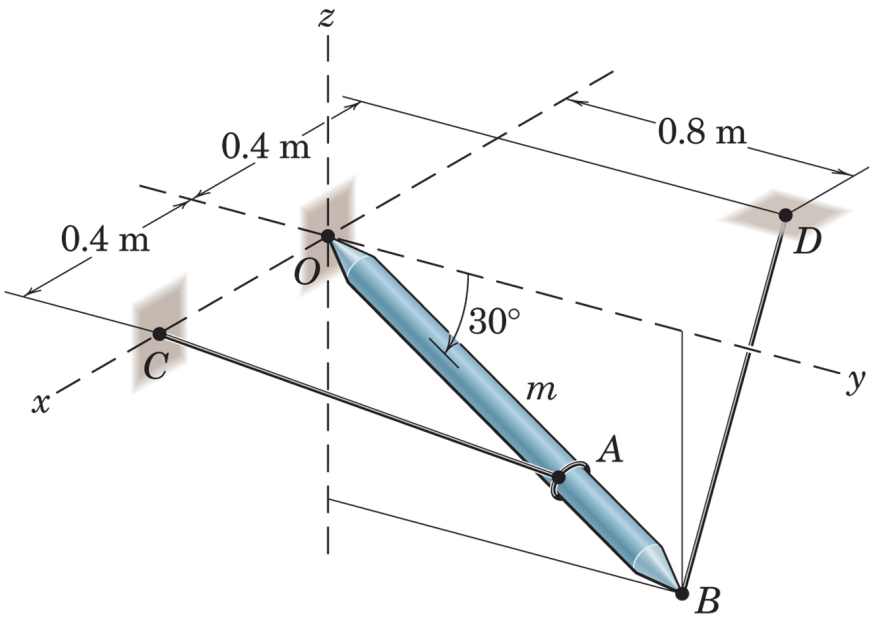
Problem 3/65

The vertical and horizontal poles at the traffic-light assembly are erected first. Determine the additional force and moment reactions at the base O caused by the addition of the three 100-lb traffic signals B, C, and D.



Problem 3/74

The uniform slender rod of mass m is suspended by a ball-and-socket joint at O and two cables. Determine the force reactions at O and the tension in each cable.



$\overline{OB} = 1.2$ m, $\overline{OA} = 0.9$ m

Problem 3/63
Determine the tension in the cables AB, AC, and AD.