

Forces and Moments: Part 6

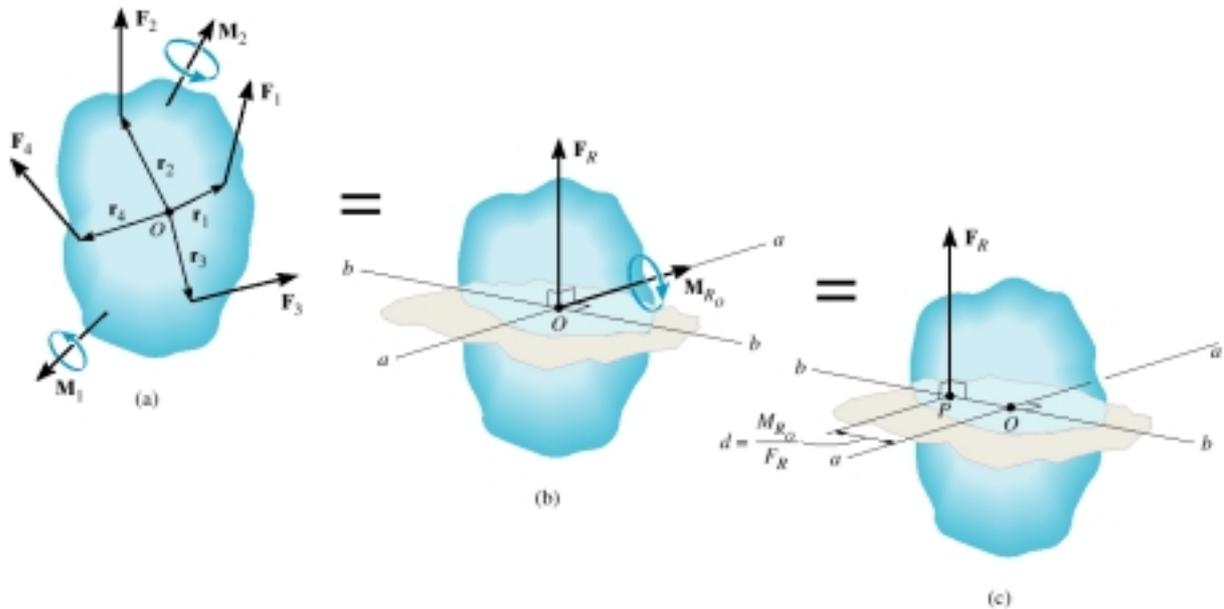
Simplification to a single resultant force:

Imagine a system of forces and moments (Fig. a), which can be simplified to a system with just one resultant force and one resultant moment (Fig. b):

$$F_R = \sum F$$

$$M_R = \sum M$$

Remember that the resultant force will always be perpendicular to the resultant moment.



Now we can further reduce the system to just a resultant force at P :

- P lies on $b-b$ axis which is perpendicular to $a-a$ axis and line of action of F_R
- P is at a distance d from O ($M_{R_O} = F_R \cdot d$, so $d = M_{R_O} / F_R$)