Resultants

Resultant: the simplest force combination which can replace the original forces applied to a rigid body without altering their effect.

Procedure to Determine the Resultant (see Fig 2/14)

1. Reposition all forces to a certain point O. Include moments induced by the reposition.

2. Sum all of the force vectors to produce the resultant force at O

\[ R = \sum F \]

and sum all of the original moments \((M_i)\) and induced moments to produce the moment associated with \(R\) at O.

\[ M_O = \sum (Fd) + \sum M_i \]

3. Reposition so that its own moment about O is \(M_O\). Its moment arm about O will be

\[ d = \frac{M_O}{R} \]