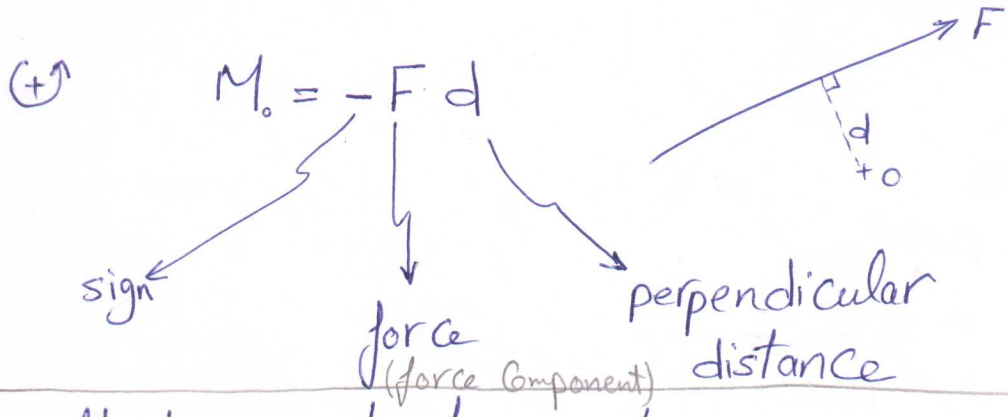
Force system resultants

lect. #4

moment

The moment of a force about a point or axis provides a measure of tendency of the force to cause a body to rotate about the point or axis.



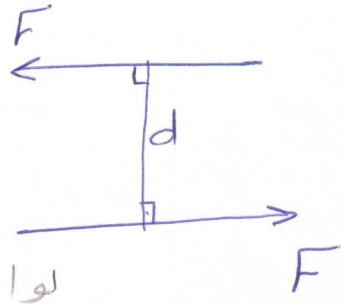
لو مرت القوه بالنقطه
∴ d = 0 ∴ M = 0

resultant moment of a system

(+↺) $M_{R_o} = \Sigma F.d$

Moment of a Couple

A Couple is defined as two parallel forces that have the same magnitude, have opposite directions, and are separated by a perpendicular distance d.



Equivalent Couples

لو امزجوا نفس الـ moment

Resultant Couple Moment

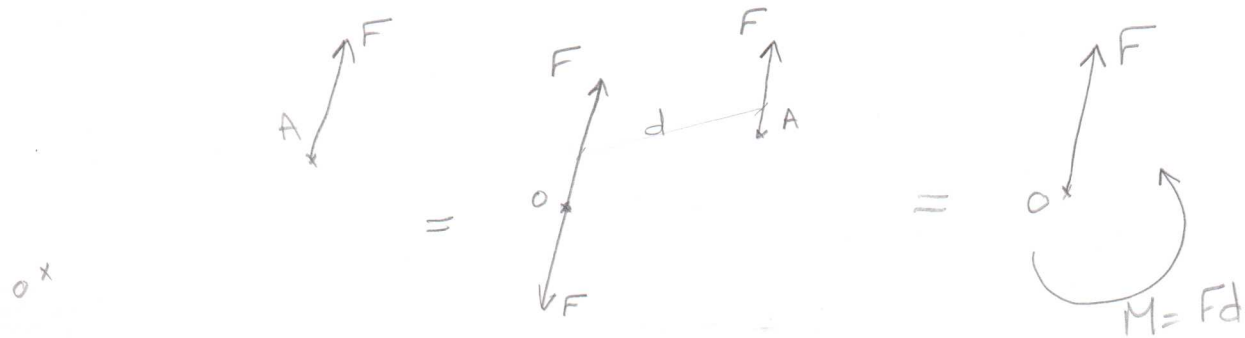
$M_R = M_1 + M_2$

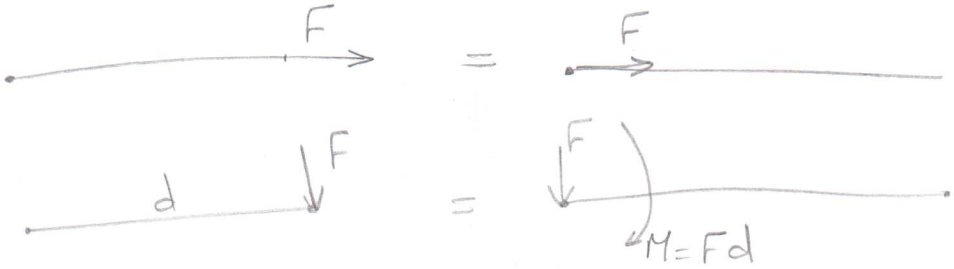
Force system resultant

⊛ An equivalent system

lect # 5

The method used to simplify a system of forces and couple moments acting on a body to a single resultant force and couple moment acting at a specified point O.



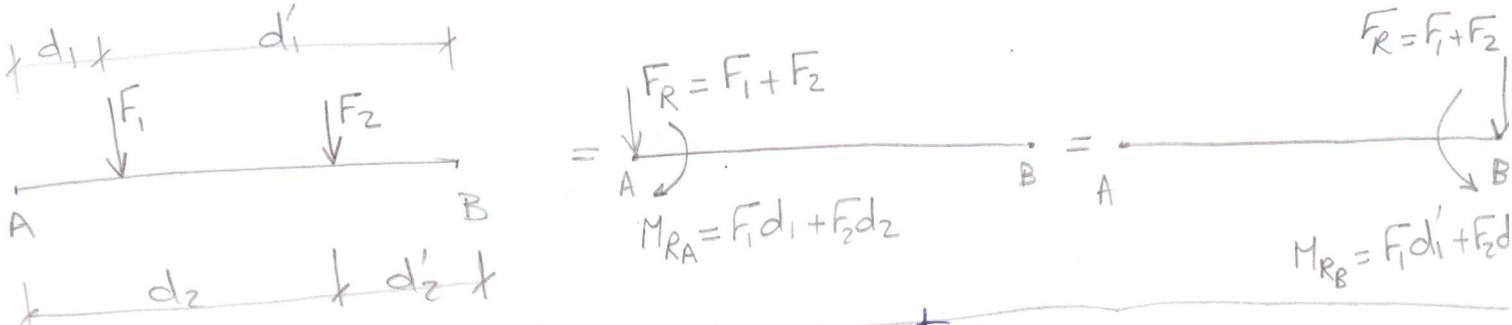


⊛ resultant of a force and couple system

$$F_{Rx} = \Sigma F_x$$

$$F_{Ry} = \Sigma F_y$$

$$M_{R_o} = \Sigma M_c + \Sigma M_o$$



⊛ Further reduction of a force and couple system