

Moment defined.

33. The product $P \cdot OB$, which is the product of the number expressing the magnitude of the force, and the length of the perpendicular dropped from the point O upon its direction, is called *the moment of the Force about that point*.

Hence the above result may be expressed by saying that when the two forces keep the system at rest, *their moments about the fixed point are equal*, the forces tending to turn the system in opposite directions about the point: but if we indicate this oppositeness of direction by difference of algebraic sign, so that the moment of one Force which tends to turn the system round in *one* direction being considered *positive*, that of another Force tending to turn it in the opposite direction will be considered *negative*; we may still more briefly express it in the form:

The algebraic sum of the moments of the two Forces round the point must be zero.

Moment of resultant of two forces which intersect is equal to sum of moments of forces.

34. *The moment of the Resultant of two intersecting Forces round any point in their plane is equal to the algebraic sum of the moments of the Forces.*



Let P, Q be the two forces intersecting in A ; O , any point in their plane; R , their Resultant.

Draw the perpendiculars OB, OC, OD .

Then (§ 23) the Resultant resolved in any direction being equal to the algebraic sum of the resolved Forces in that

direction, let them be resolved perpendicularly to OA . Hence, from § 21,

$$R \sin OAD = P \sin OAB + Q \sin OAC;$$