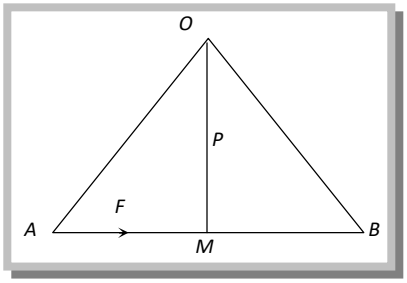
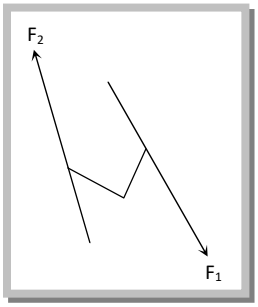
Moment.



The moment of a force about a point O is given in magnitude by the product of the forces and the perpendicular distance of O from the line of action of the force.

If F be a force acting a point A of a rigid body along the line AB and OM (= p) be the perpendicular distance of the fixed point O from AB, then the moment of force about $O = F.p = AB \times OM = 2\left[\frac{1}{2}(AB \times OM)\right] = 2(\text{area of } \Delta AOB)$

The S.I. unit of moment is Newton-meter (N-m).



(1) **Sign of the moment:** The moment of a force about a point measures the tendency of the force to cause rotation about that point. The tendency of the force F_1 is to turn the lamina in the clockwise direction and of the force F_2 is in the anticlockwise direction. The usual convention is to regard the moment which is anticlockwise direction as positive and that in the clockwise direction as negative.

(2) **Varignon's theorem:** The algebraic sum of the moments of any two coplanar forces about any point in their plane is equal to the moment of their resultant about the same point.

Note: Thy algebraic sum of the moments of any two forces about any point on the line of action of their resultant is zero.

Conversely, if the algebraic sum of the moments of any two coplanar forces, which are not in equilibrium, about any point in their plane is zero, their resultant passes through the point.

If a body, having one point fixed, is acted upon by two forces and is at rest. Then the moments of the two forces about the fixed point are equal and opposite.