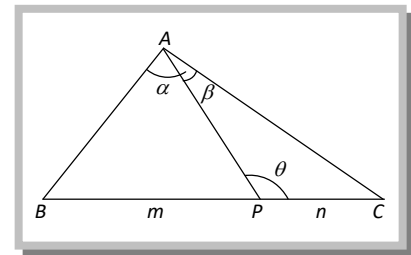


Equilibrium of Coplanar Forces.

- (1) If three forces keep a body in equilibrium, they must be coplanar.
- (2) If three forces acting in one plane upon a rigid body keep it in equilibrium, they must either meet in a point or be parallel.
- (3) When more than three forces acting on a rigid body, keep it in equilibrium, then it is not necessary that they meet at a point. The system of forces will be in equilibrium if there is neither translatory motion nor rotatory motion.
i.e. $X = 0, Y = 0, G = 0$ or $R = 0, G = 0$.

(4) A system of coplanar forces acting upon a rigid body will be in equilibrium if the algebraic sum of their resolved parts in any two mutually perpendicular directions vanish separately, and if the algebraic sum of their moments about any point in their plane is zero.

(5) A system of coplanar forces acting upon a rigid body will be in equilibrium if the algebraic sum of the moments of the forces about each of three non-collinear points is zero.



- (6) Trigonometrical theorem: If P is any point on the base BC of $\triangle ABC$ such that $BP : CP = m : n$.
Then, (i) $(m + n)\cot \theta = m \cot \alpha - n \cot \beta$ where $\angle BAP = \alpha, \angle CAP = \beta$
(ii) $(n + n)\cot \theta = n \cot B - m \cot C$