

Triangle theorem of Couples.

If three forces acting on a body be represented in magnitude, direction and line of action by the sides of triangle taken in order, then they are equivalent to a couple whose moment is represented by twice the area of triangle.

Consider the force P along AE , Q along CA and R along AB . These forces are three concurrent forces acting at A and represented in magnitude and direction by the sides BC , CA and AB of $\triangle ABC$. So, by the triangle law of forces, they are in equilibrium.

The remaining two forces P along AD and P along BC form a couple, whose moment is $m = P.AL = BC.AL$

Since $\frac{1}{2}(BC.AL) = 2\left(\frac{1}{2} \text{area of the } \triangle ABC\right)$

\therefore Moment = $BC.AL = 2$ (Area of $\triangle ABC$)

