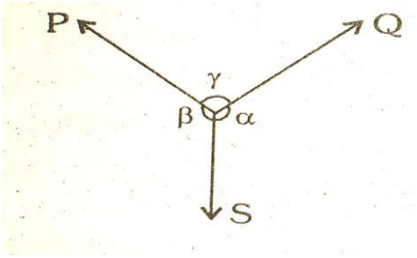
Lame's theorem in Applied Mechanics

Lame's theorem:

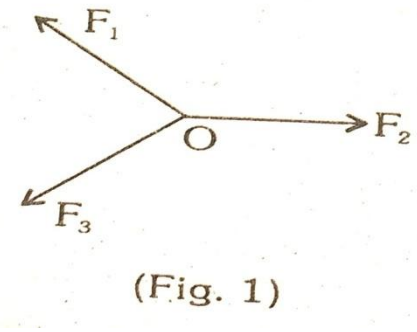
It states that "If three coplanar forces acting at a point be in equilibrium, then each force is proportional to the sine or the angle between the other two"

Mathematicals, $\frac{P}{\sin \alpha} = \frac{Q}{\sin \beta} = \frac{Q}{\sin \gamma}$



Note :

1. Lami's theorem is only applied for three coplanar concurrent forces, which are in equilibrium.
2. Also, the concurrent forces should act outwards from a point. For example, Lami's theorem cannot be applied directly for three concurrent equilibrium forces shown in fig below.



(Fig. 1)

because the force F_1 is acting towards the particle.

Hence, the force F_1 is taken as outward force as shown in the fig. below, and Lami's theorem is applied.

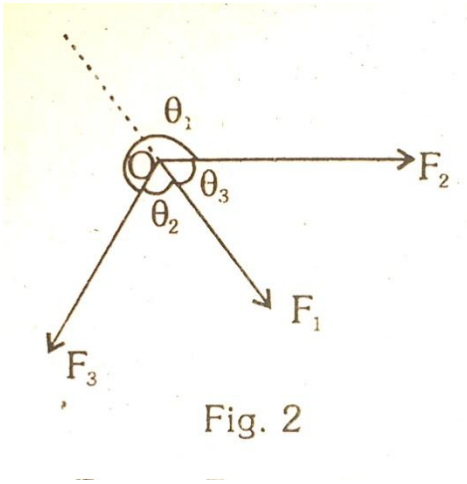


Fig. 2

3.But the forces shown in fig.(1) can be solved directly

By the equations of equilibrium I,

e $\sum H$ =0

$\sum V$=0.