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Q4 Ans :-

Resultant of collinear Coplanar forces :-

- The resultant is obtained by adding all the forces if they are acting in the same direction.

If any one of the forces is acting in the opp. direction, then resultant is obtained by subtracting that force.

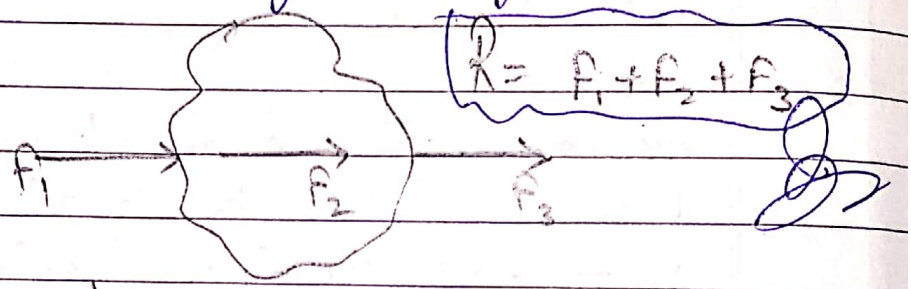

Fig :- Collinear Coplanar forces

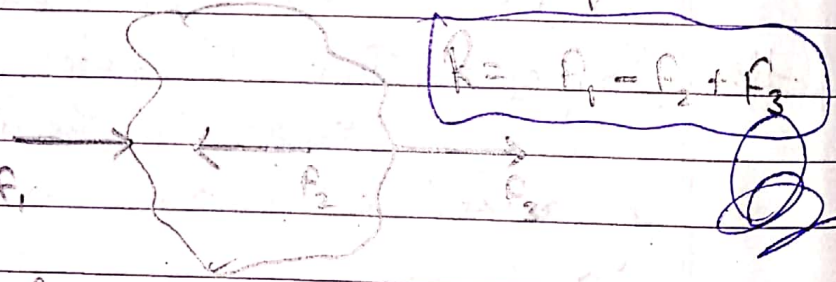

Fig :- Collinear Coplanar forces

$$R = \sqrt{(P\cos\theta)^2 + (P\sin\theta)^2}$$

- $R = \sqrt{P^2 + Q^2 + 2PQ\cos\alpha}$
- $\theta = \tan^{-1}\left(\frac{Q\sin\alpha}{P + Q\cos\alpha}\right)$

→ When two forces Act at a point.

- $R = \sqrt{(\Sigma F_H)^2 + (\Sigma F_V)^2}$
- $\tan\theta = \frac{\Sigma F_V}{\Sigma F_H}$

→ When more than two forces Act at a point

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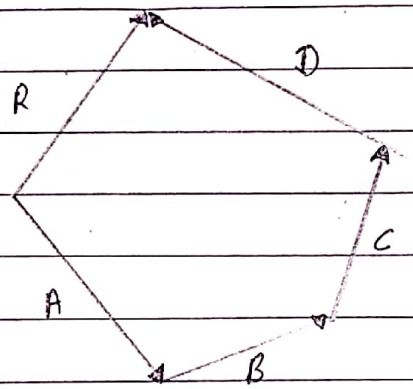
#> Polygon law of forces :-

- If a no. of forces acting simultaneously on particle be represented in magnitude and direction by the sides of a polygon taken in order, their resultant may be represented in magnitude and direction by the closing side of the polygon taken in opposite order.



Where A, B, C, & D are the forces & R → resultant force.

*> Ductile Material :-

Ductile means a material is easily bent, stretched, flattened or otherwise worked. It means you can use stress to make changes in the shape characteristics and the material will change without breaking, like wet clay will smoosh b/w your fingers when squeezed.

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* Brittle Material :- Brittle means when you do work on a material - it is likely to crack or fall into piece, like when you squeeze dry clay btw your fingers, it crumbles.