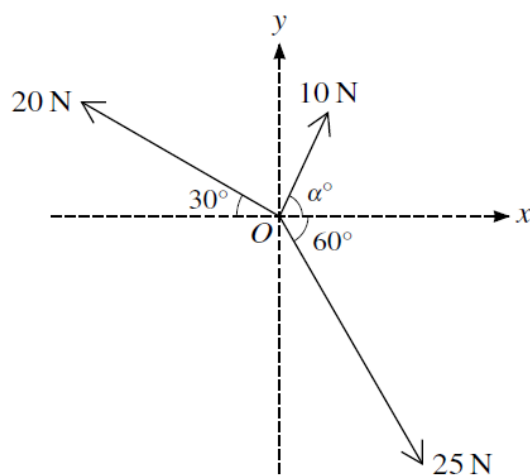


## Forces and Equilibrium – 2021 AS

1. June/2021/Paper\_9709/41/No.6

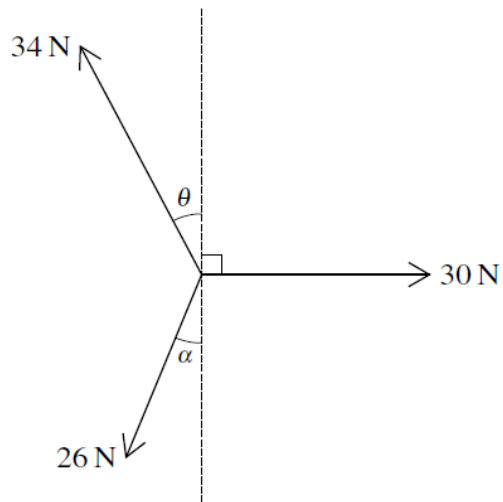


Three coplanar forces of magnitudes 10 N, 25 N and 20 N act at a point  $O$  in the directions shown in the diagram.

(a) Given that the component of the resultant force in the  $x$ -direction is zero, find  $\alpha$ , and hence find the magnitude of the resultant force. [4]

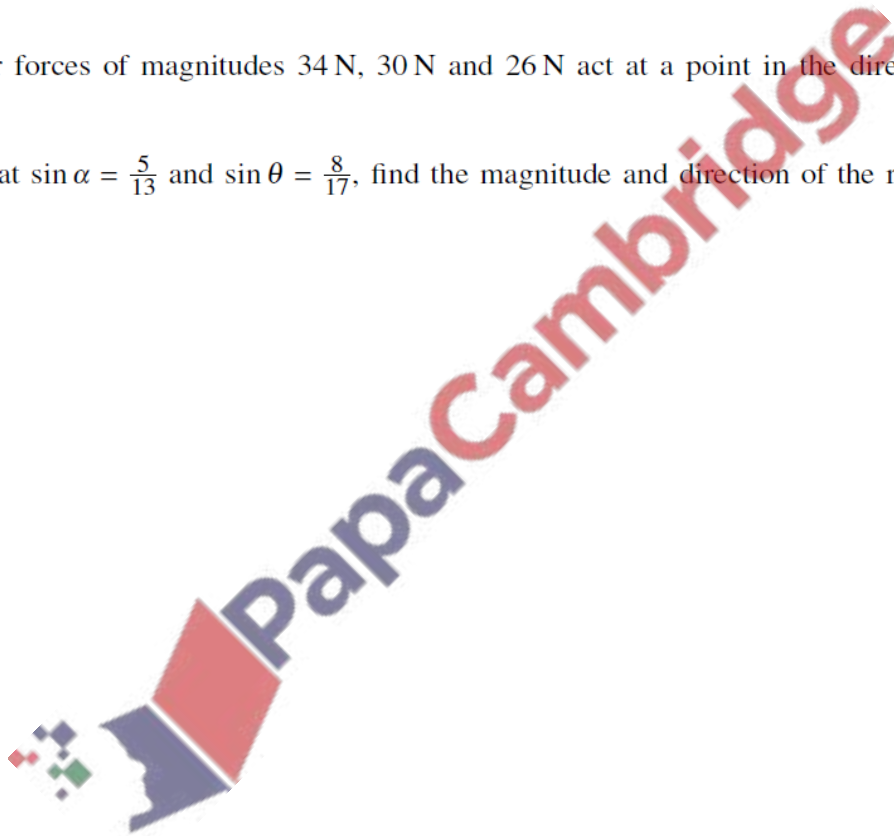
(b) Given instead that  $\alpha = 45$ , find the magnitude and direction of the resultant of the three forces. [5]

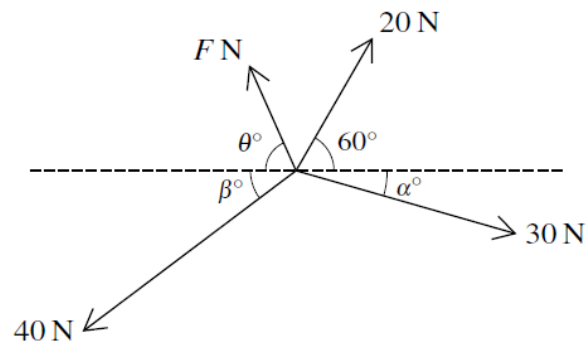




Coplanar forces of magnitudes 34 N, 30 N and 26 N act at a point in the directions shown in the diagram.

Given that  $\sin \alpha = \frac{5}{13}$  and  $\sin \theta = \frac{8}{17}$ , find the magnitude and direction of the resultant of the three forces. [6]





Four coplanar forces act at a point. The magnitudes of the forces are 20 N, 30 N, 40 N and  $F$  N. The directions of the forces are as shown in the diagram, where  $\sin \alpha^\circ = 0.28$  and  $\sin \beta^\circ = 0.6$ .

Given that the forces are in equilibrium, find  $F$  and  $\theta$ .

[6]

