Forces of magnitudes 7 N, 10 N and 15 N act on a particle in the directions shown in the diagram.

(i) Find the component of the resultant of the three forces
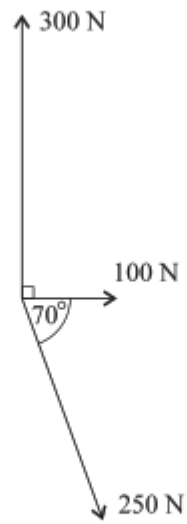
    (a) in the x-direction,
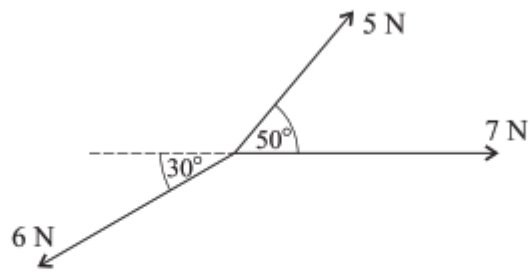
    (b) in the y-direction.

                  [3]

(ii) Hence find the direction of the resultant.   [2]
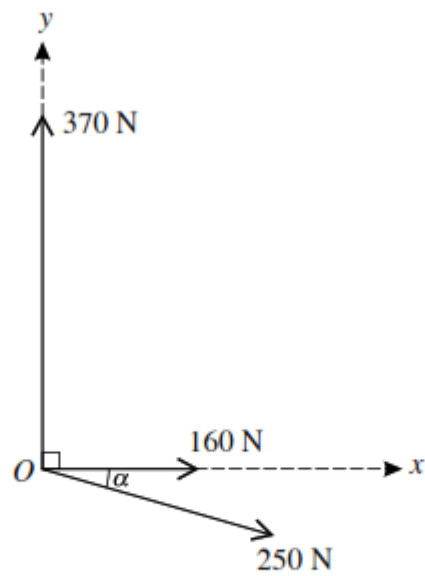
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300 N

100 N

70°

250 N

Coplanar forces of magnitudes 250 N, 100 N and 300 N act at a point in the directions shown in the diagram. The resultant of the three forces has magnitude R N, and acts at an angle $\alpha°$ anticlockwise from the force of magnitude 100 N. Find R and α. [6]

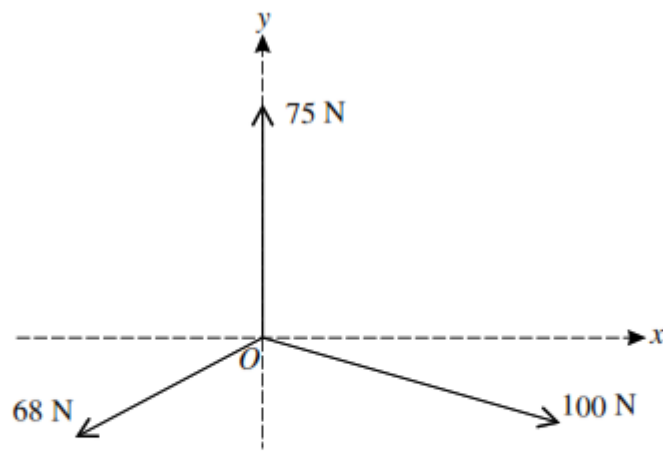*M.JAWAD AMIN*

5 N

7 N

50°

30°

6 N

Three coplanar forces act at a point. The magnitudes of the forces are 5 N, 6 N and 7 N, and the directions in which the forces act are shown in the diagram. Find the magnitude and direction of the resultant of the three forces.   [6]

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Coplanar forces of magnitudes 250 N, 160 N and 370 N act at a point O in the directions shown in the diagram, where the angle α is such that $\sin \alpha = 0.28$ and $\cos \alpha = 0.96$. Calculate the magnitude of the resultant of the three forces. Calculate also the angle that the resultant makes with the x-direction.

[7]

Three coplanar forces of magnitudes 68 N, 75 N and 100 N act at an origin O, as shown in the diagram. The components of the three forces in the positive x-direction are -60 N, 0 N and 96 N, respectively. Find
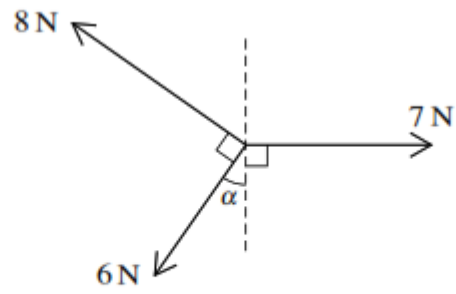
   (i) the components of the three forces in the positive y-direction,   [3]

   (ii) the magnitude and direction of the resultant of the three forces.   [4]
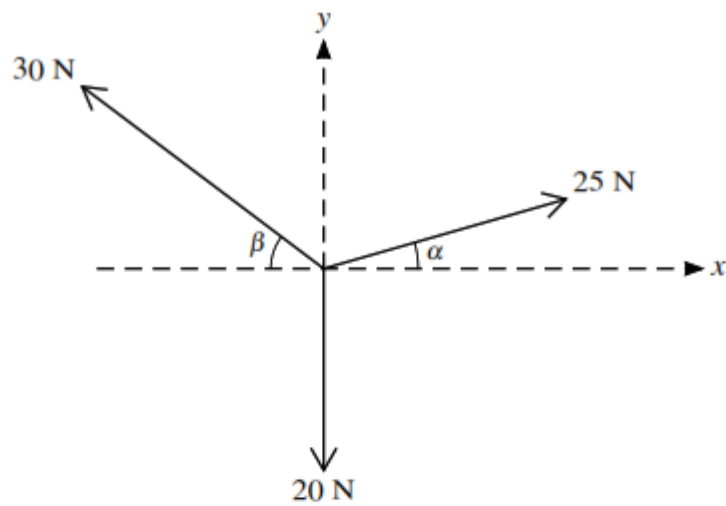
Three coplanar forces act at a point. The magnitudes of the forces are 20 N, 25 N and 30 N, and the directions in which the forces act are as shown in the diagram, where $\sin \alpha = 0.28$ and $\cos \alpha = 0.96$, and $\sin \beta = 0.6$ and $\cos \beta = 0.8$.

(i) Show that the resultant of the three forces has a zero component in the x-direction. [2]

(ii) Find the magnitude and direction of the resultant of the three forces. [2]

(iii) The force of magnitude 20 N is replaced by another force. The effect is that the resultant force is unchanged in magnitude but reversed in direction. State the magnitude and direction of the replacement force. [1]

Coplanar forces of magnitudes 7 N, 6 N and 8 N act at a point in the directions shown in the diagram. Given that $\sin \alpha = \frac{3}{5}$, find the magnitude and direction of the resultant of the three forces. [5]