

5.

Figure 1

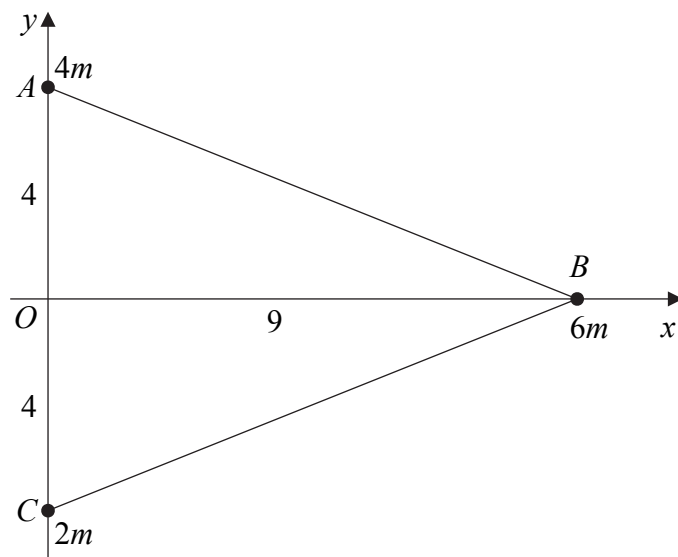


Figure 1 shows a triangular lamina ABC . The coordinates of A , B and C are $(0, 4)$, $(9, 0)$ and $(0, -4)$ respectively. Particles of mass $4m$, $6m$ and $2m$ are attached at A , B and C respectively.

- (a) Calculate the coordinates of the centre of mass of the three particles, *without the lamina*. (4)

The lamina ABC is uniform and of mass km . The centre of mass of the combined system consisting of the three particles and the lamina has coordinates $(4, \lambda)$.

- (b) Show that $k = 6$. (3)

- (c) Calculate the value of λ . (2)

The combined system is freely suspended from O and hangs at rest.

- (d) Calculate, in degrees to one decimal place, the angle between AC and the vertical. (3)



