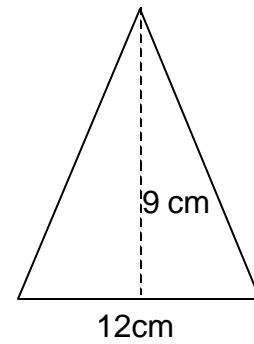


To find the centre of mass of the isosceles triangle shown. (Outside Syllabus)



Solution :

Due to symmetry, the centre of mass must lie on the axis shown (dotted line) above.

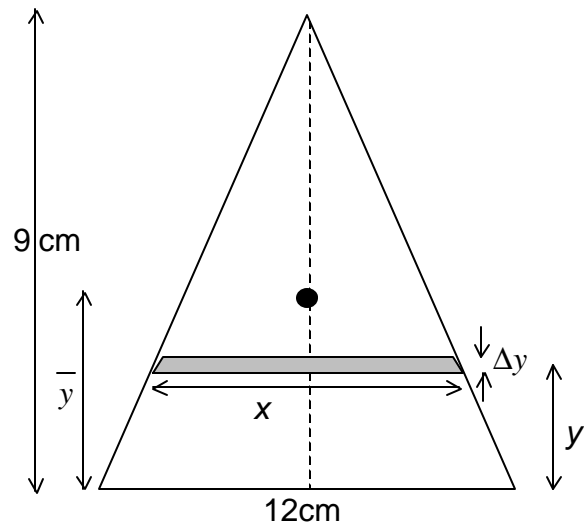
Assume the centre of mass is at a distance \bar{y} from the base of the triangle.

Considering similar triangles, $\frac{9-y}{x} = \frac{9}{12}$

$$\therefore x = \frac{4}{3}(9-y)$$

shaded area $\Delta A = x \Delta y$

$$\begin{aligned} \bar{y} &= \frac{\sum \Delta A \cdot y}{A} \\ &= \frac{\int y (x \Delta y)}{A} \\ &= \frac{\int_0^9 \frac{4}{3}(9-y)y \Delta y}{\frac{1}{2}(12)(9)} \\ &= \frac{4 \left(\frac{9}{2} y^2 - \frac{1}{3} y^3 \right) \Big|_0^9}{54} \\ &= \frac{162}{54} \\ &= 3 \end{aligned}$$



\therefore The centre of mass is at a distance 3cm from the base of the triangle.