

Q1.

Let $A(1, 0)$, $B(6, 2)$ and $C\left(\frac{3}{2}, 6\right)$ be the vertices of a triangle

ABC . If P is a point inside the triangle ABC such that the triangles APC , APB and BPC have equal areas, then the length of the line segment

PQ , where Q is the point $\left(-\frac{7}{6}, -\frac{1}{3}\right)$, is _____.

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Sol 1. **(d)** Let $(1, \sqrt{3})$, $(0, 0)$ and $(2, 0)$ are the coordinates of vertices A, O, B of ΔABC .

$\therefore AO = OB = AB$. So, it is an equilateral triangle and the incentre coincides with centroid.

$$\therefore \text{Incentre} = \left(\frac{0+1+2}{3}, \frac{0+0+\sqrt{3}}{3} \right) = \left(1, \frac{1}{\sqrt{3}} \right)$$