

MEI Pure Mathematics Core 1

Co-ordinate geometry

Ex 2D

⑩ i) $g_{BC} = \frac{6}{-2} = \underline{-3}$

ii) $g_{AL} = \frac{1}{3}$ since $AL \perp$ to BC

Eqnⁿ AL $y - 1 = \frac{1}{3}(x + 2)$ → Careful with the sign

$3y = x + 5$

iii) BM is \parallel to y axis \therefore Eqnⁿ $x = 1$

iv) AL meets BM where $3y = 1 + 5$
 $y = 2$ $H(1, 2)$

v) $g_{CH} = -\frac{1}{2}$ $g_{AB} = \frac{6}{3} = 2$

$g_{CH} \times g_{AB} = -1$ \therefore $CH \perp$ to AB .

vi) We want co-ords of L . to get lengths $LH + BL$

AL meets BC where $3y = x + 5$ meets $y + 3x = 10$

$3y = -9x + 30$
 $0 = 10x - 25$ $x = \frac{5}{2}$
 $y = \frac{5}{2}$ } L .

length $AL = \sqrt{\left(\frac{9}{2}\right)^2 + \left(\frac{3}{2}\right)^2}$
 $= \frac{\sqrt{90}}{2}$

length $BL = \sqrt{\frac{9}{4} + \frac{81}{4}}$
 $= \frac{\sqrt{90}}{2}$

length $HL = \sqrt{\left(\frac{3}{2}\right)^2 + \left(\frac{1}{2}\right)^2}$
 $= \frac{\sqrt{10}}{2}$

Area $BLH = \frac{1}{2} \frac{\sqrt{10}}{2} \frac{\sqrt{90}}{2}$
 $= \frac{15}{4}$ units

H is at pr intesection of medians
 $\therefore LH = \frac{1}{3}$ of AL
 as an alternative method