médiane issue de B

L (milieu de (AC)) = $\frac{A+C}{2} = (\frac{2}{2}; \frac{6}{2}) \Rightarrow (1,3)$

$\vec{BL} = L - B = (1+3);(3+1) \Rightarrow (4,4)$

$M(x,y) \in M_B = (BL) \Leftrightarrow \vec{BM}(x-1, y-3) \parallel \vec{BL}(4,4)$

$$\begin{vmatrix} x-1 & 4 \\ y-3 & 4 \end{vmatrix} = 0$$

$(x-1)\cdot 4 - 4\cdot(y-3) = 0$

$4x - 4 - (4y - 12) = 0$

$4x - 4 - 4y + 12 = 0$

$4x - 4y + 8 = 0 \quad /:4$

$\underline{x - y + 2 = 0}$

c) h_B ... la hauteur issue du point B

$\vec{AC} = (-2,4)$

$B \in h_B: -2x + 4y + c = 0$

$-2\cdot(-3) + 4\cdot(-1) + c = 0$

$6 - 4 + c = 0$

$2 + c = 0$

$c = -2$

$-2x + 4y - 2 = 0 \quad /\cdot(-1)$

$\underline{2x - 4y + 2 = 0} \quad /:2$

$x - 2y + 1 = 0$

h_C ... la hauteur issue du point C

$\vec{AB} = (-5,-2)$

$C \in h_C: -5x - 2y + c = 0$

$-5\cdot 0 - 2\cdot 5 + c = 0$

$0 - 10 + c = 0$

$c = 10$

$-5x - 2y + 10 = 0 \quad /\cdot(-1)$

$\underline{5x + 2y - 10 = 0}$

d) M_{BC} ..K milieu du segment [BC]

$\vec{BC} = C - B = (3;6) \qquad K(-\frac{3}{2}, \frac{4}{2})$

$3x + 6y + c = 0$

$3\cdot(-\frac{3}{2}) + 6\cdot\frac{4}{2} + c = 0$

$-\frac{9}{2} + \frac{24}{2} + c = 0$

$\frac{15}{2} + c = 0$

$c = -\frac{15}{2}$

$3x + 6y - \frac{15}{2} = 0 \quad /\cdot 2$

$6x + 12y - 15 = 0 \quad /:3$

$\underline{2x + 4y - 5 = 0}$

M_{AC} ... L milieu du segment [AC]

$\vec{AC} = C - A = (-2,4) \qquad L(1,3)$

$-2x + 4y + c = 0$

$-2\cdot 1 + 4\cdot 3 + c = 0$

$-2 + 12 + c = 0$

$10 + c = 0$

$c = -10$

$-2x + 4y - 10 = 0 \quad /:2$

$-x + 2y - 5 = 0 \quad /\cdot(-1)$

$\underline{x - 2y + 5 = 0}$

Calculer:

a) $G = \frac{A+B+C}{3}$

$G_x = \frac{2-3+0}{3} = \frac{-1}{3}$

$G_y = \frac{1-1+5}{3} = \frac{5}{3}$

$\underline{G(-\frac{1}{3}, \frac{5}{3})}$

b) orthocentre est le point d'intersection des 3 hauteurs d'un triangle

$2x - 4y + 2 = 0$

$\underline{5x + 2y - 10 = 0} \quad /\cdot 2$

$2x - 4y + 2 = 0$

$\underline{10x + 4y - 20 = 0}$

$12x - 18 = 0$