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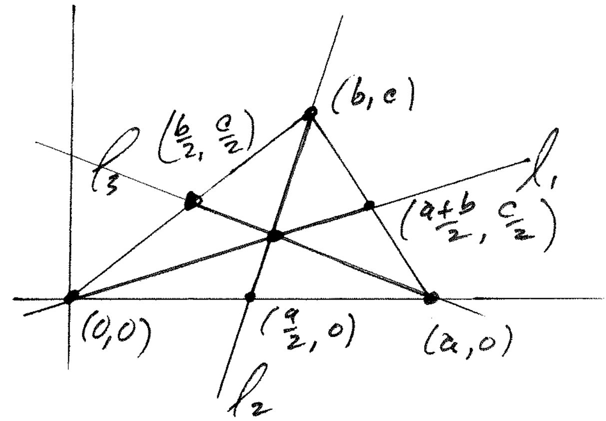
Proof of conjecture regarding the concurrency of the medians of a triangle.

The medians are carried by the three lines



$$l_1: \quad y = \left(\frac{c}{a+b}\right)x$$

$$l_2: \quad y = \left(\frac{2c}{2b-a}\right)x - \frac{ac}{2b-a}$$

$$l_3: \quad y = \left(\frac{+c}{b-2a}\right)x + \frac{ac}{2a-b}$$

Solving by matrix methods

$$\left[\begin{array}{cc|c} \frac{c}{a+b} & -1 & 0 \\ \frac{2c}{2b-a} & -1 & +\frac{ac}{2b-a} \\ \frac{c}{b-2a} & -1 & -\frac{ac}{2a-b} \end{array}\right] \sim \left[\begin{array}{cc|c} 1 & -\frac{(a+b)}{c} & 0 \\ \frac{2c}{2b-a} & -1 & +\frac{ac}{2b-a} \\ \frac{c}{b-2a} & -1 & \frac{-ac}{2a-b} \end{array}\right]$$

$$\sim \left[\begin{array}{cc|c} 1 & -\frac{(a+b)}{c} & 0 \\ 0 & \frac{3a}{2b-a} & \frac{+ac}{2b-a} \\ 0 & \frac{3a}{b-2a} & \frac{-ac}{2a-b} \end{array}\right] \sim \left[\begin{array}{cc|c} 1 & -\frac{(a+b)}{c} & 0 \\ 0 & 1 & +\frac{c}{3} \\ 0 & 1 & +\frac{c}{3} \end{array}\right]$$

$$\sim \left[\begin{array}{cc|c} 1 & 0 & \frac{a+b}{3} \\ 0 & 1 & \frac{c}{3} \\ 0 & 0 & 0 \end{array}\right] \Longrightarrow$$

There is a unique point of intersection at $\left(\frac{a+b}{3}, \frac{c}{3}\right)$