

Title	Some characterisations of concurrency points in a triangle
Authors	De, Prithwjit;MacHale, Des
Publication date	2025-02-17
Original Citation	De, P. and MacHale, D. (2025) 'Some characterisations of concurrency points in a triangle', The Mathematical Gazette, 109(574), pp.52-58. https://doi.org/10.1017/mag.2025.9
Type of publication	Article (peer-reviewed);journal-article
Link to publisher's version	10.1017/mag.2025.9
Rights	© 2025, The Authors. Published by Cambridge University Press on behalf of The Mathematical Association.
Download date	2026-10-28 14:06:29
Item downloaded from	https://hdl.handle.net/10468/17698

Review of 6943: Some Characterisations of Concurrency Points in a Triangle

This is quite nice, but needs a bit of reorganisation. Suggestions below.

- p.2, $\ell\ell.1$ –3: Replace with “Similarly, $s = p$ and $t = q$.”
- p.2, $\ell\ell.4$ –6: Replace with “Similarly, BY and CZ are medians, so M is the centroid and $k = 2$.”
- Proof of lemma 1: I don’t see the need for the contradiction, and in any case you have not said that you are assuming X' is to the right of X . Why not say:

“If the bisector of $\angle BAC$ meets BC at X' , then

$$\frac{BX'}{AB} = \frac{CX'}{AC}.$$

So $BX' : CX' = AB : AC = BX : CX$, whence $X' = X$.”

- p.4, $\ell.2$: Replace with “By Pythagoras,”
- p.4, $\ell\ell.6$ –7: replace with “Adding gives the result.”
- p.4, Theorem 3: in the displayed equation, replace XC by CX .
- p.4, Proof of theorem 3: your labelling is unsystematic. I suggest you replace “ x, p, z, q, y, r ” with “ z, r, x, p, y, q ” (that is, x and p opposite A . etc.), with corresponding adjustments later.
- p.5, Proof of theorem 4: in the displayed equations, the third item is derived from the first, not the second, so it would be much clearer if you interchanged the first two items, so that each item is derived from its immediate predecessor.

Then, in the next few lines, the labelling is unsystematic: let the tangent lengths from a, b, c be x, y, z respectively. I suggest:

Let $AZ = x$, $BX = y$ and $CX = z$. Then $x + y + z = s$, where $s = \frac{1}{2}(a + b + c)$, whence $x = s - a$, $y = s - b$ and $z = s - c$, and these are the tangent lengths to the incircle from the vertices.

- p.5, last line: incorrect use of $\Rightarrow$: “ $P \Rightarrow Q$ ” means “If P is true, then so is Q ”, whereas what you are trying to say is “ P is true, and therefore Q is also true”.

But in any case this needs another line of explanation. I suggest that you replace “ $\Rightarrow$ ” with

“, that is, $(2\mathbf{p} - \mathbf{a} - \mathbf{b}).(\mathbf{b} - \mathbf{a}) = (\mathbf{a} + \mathbf{b} - 2\mathbf{c}).(\mathbf{a} - \mathbf{b})$. So”

- Final sentence: I’m not sure the editors would want you to encourage a flood of submissions: some industrious souls are bound to start working their way through Kimberling’s encyclopædia! And “the many” is a bold claim: there are thousands of triangle centres. Perhaps replace with something a little more cautious: “Doubtless such characterisations exist for other triangle centres, which the reader might like to investigate.”