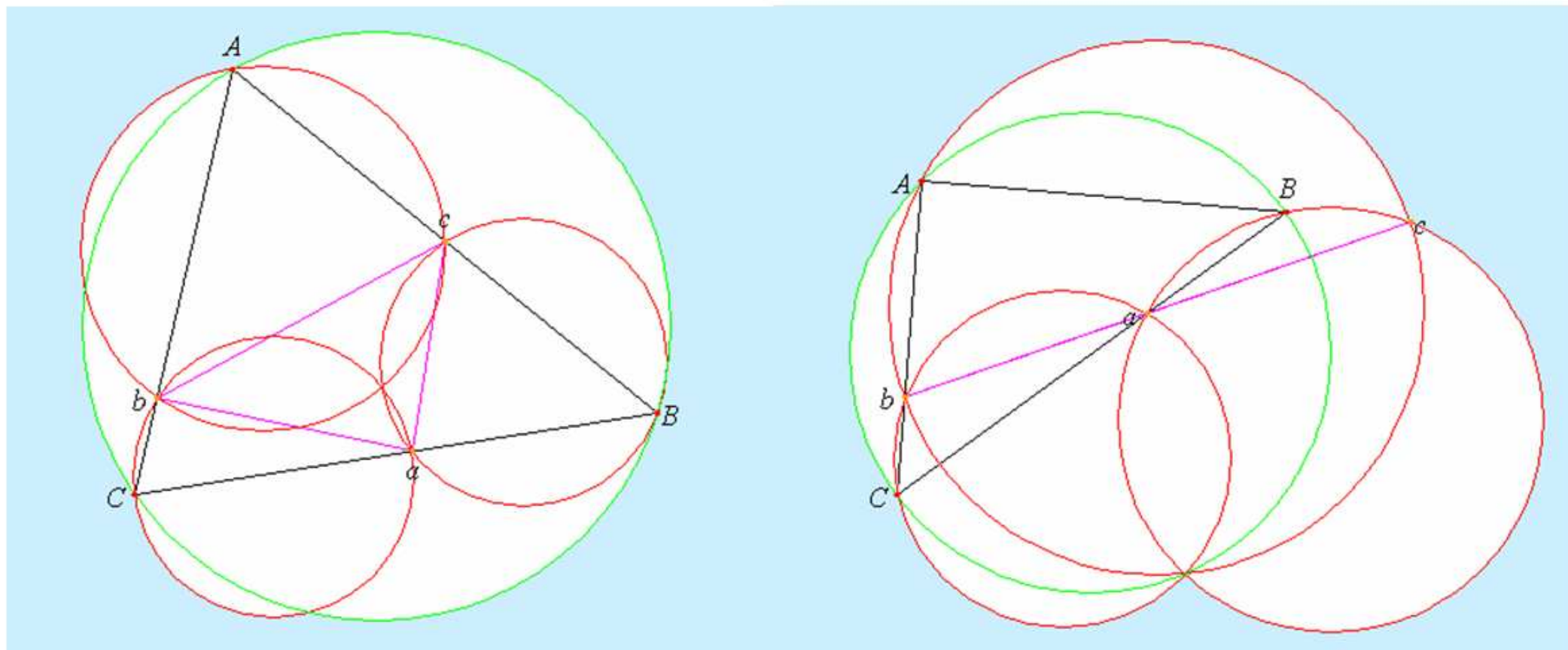




# THEOREM OF THE DAY



**Miquel's Triangle Theorem** Let  $A$ ,  $B$  and  $C$  be the vertices of a triangle and  $a$ ,  $b$  and  $c$  be points chosen on sides  $CB$ ,  $AC$  and  $AB$ , respectively. Then the circles defined by  $bAc$ ,  $cBa$  and  $aCb$  have a common point of intersection. Moreover, if  $a$ ,  $b$  and  $c$  are chosen to be collinear then this point lies on the circle defined by  $A$ ,  $B$  and  $C$ .



The above picture (created using David Joyces wonderful Geometry Applet package) shows Miquel's Theorem in action. Changing the size or shape of triangle  $ABC$ , or moving any of the side points  $a$ ,  $b$  or  $c$ , will move but not destroy the point of intersection of the three red circles. The magenta triangle  $abc$  reduces to a line when its vertices are collinear, as on the right, and at this point we find the red circles intersect in a point on the green circle on  $ABC$ .

Auguste Miquel was a French mathematician active in the mid-nineteenth century. The point of intersection of the circles in this theorem is known as the 'Miquel Point'.

**Web link:** [kskedlaya.org/geometryunbound/](http://kskedlaya.org/geometryunbound/), see section 1.2 of "notes from August 1999" (under "Non-GFDL").

**Further reading:** *Episodes in Nineteenth and Twentieth Century Euclidean Geometry*, by Ross Honsberger, The Mathematical Association of America, 1996.

