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Two Romanian mathematicians, Ioan Casu and Arpad Benyl, redirected back to a discovery in 1936 by another Romanian mathematician, Dimitre Pompieu. The theorem is known as Pompieu’s Theorem and states that:

*Given: an equilateral triangle ∆ABC, where M is a point in the plane determined by it. The lengths MA, MB, and MC all form the sides of the triangle. The triangle formed by these sides is degenerate if and only if M lies on the circumcircle of ∆ABC.*

Casy and Benyl mention that most students will encounter this theorem as a corollary to the Ptolemy inequality, which refers to a quadrilateral with all four vertices on a circle. After this, they mention Pompieu’s Area Formula, which states that:

*Let ∆ABC be acute with side-lengths a, b, and c and area S0, and let M be a point in its interior. Let S\* denote the area of the triangle having side-lengths MA, MB, and MC, and let S1, S2, S3 denote the areas of ∆BCM, ∆CAM, and ∆ABM. Then*

*S\* S0 = S1 S2 + S2 S3 + S3 S1.*

Ioan Casu and Arpad Benyl revisited this old theorem to prove it in multiple ways because the original as through complex numbers. So they included a proof using inversion as well.