Journal of Advances in Mathematics Vol 25 (2026) ISSN: 2347-1921 https://rajpub.com/index.php/jam

DOI: https://doi.org/10.24297/jam.v25i.9837

Euler's Number in Right Triangles

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This paper is a single page rapid communication of an explicit and intriguing formula that yields the precise value of Euler's number ***(e)*** from the side lengths of right angled triangles.

Consider a right triangle (**a, b, c**) with **a** and **b** as its shorter and longer legs respectively, and **c** is the hypotenuse. Then, the $\left(\text{arsinh}\left(\frac{a}{c-b}\right)\right)^{th}$ root of cotangent of one quarter of the smaller acute angle of the right triangle (a, b, c) precisely equals the Euler's number ***(e)***.

In exponent notation :

$$\left[\cot\left(\frac{\theta}{4}\right)\right]^{\frac{1}{\text{arsinh}\frac{a}{c-b}}} = e$$

where **θ** the smaller acute angle of the right triangle (a, b, c).

Similarly, the $\left(\text{arsinh}\left(\frac{b}{c-a}\right)\right)^{th}$ root of cotangent of one quarter of the larger acute angle of the right triangle (a, b, c) precisely equals the Euler's number ***(e)***.

References : None

Funding Statement : This research work is self-sponsored by the author