

On inequalities of generalized elliptic integrals

Barkat Ali Bhayo

(Department of mathematics, Sukkur IBA University, Pakistan)

E-mail: barkat.bhayo@iba-suk.edu.pk

As an application of the eigenfunctions \sin_p , $1 < p < \infty$ of so-called one-dimensional p -Laplacian [3], we introduce new generalized elliptic integrals K_p , E_p of the first and the second kind, respectively, and establish two-sided inequalities. As well as, we estimate above and below the perimeter $P = \int_0^{\pi_p/2} \sqrt[p]{1 - r^p \sin_p(t)^p} dt = 4aE_p(r)$ of generalized p -ellipse whose parametric equations are $x = a(1 - \sin_p(t)^p)^{1/p}$ and $y = b \sin_p(t)$ for $0 < t < 2\pi_p = 4\arcsin_p(1)$.

REFERENCES

- [1] B.A. BHAYO AND M. VUORINEN: On generalized trigonometric functions with two parameters. *J. Approx. Theory* Vol. 164, 10(2012), 1415–1426.
- [2] B.A. BHAYO AND L. YIN: On generalized (p, q) -elliptic integrals. <http://arxiv.org/abs/1507.00031>.
- [3] P. DRABEK AND R. MANASEVICH: On the closed solution to some p -Laplacian nonhomogeneous eigenvalue problems. *Diff. and Int. Eqns.* 12 (1999), 723–740.