Parametric Solutions of Ternary Quadratic Diophantine Equations

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Abstract: *This study investigates a generalized quadratic Diophantine equation $s^2 + t^2 - r^2 = (\mathcal{K} + \mathcal{P})^2$ with three unknowns s, t, r, extending classical techniques to explore connections with Krishnamurthy number $\mathcal{K}$ and Leyland primes $\mathcal{P}$ with values up to 5-digits. Distinct solution strategies are presented, and integer solutions satisfying the equation are explicitly computed with MATLAB scripts.*

Keywords*:* Diophantine equation, Ternary quadratic Diophantine equation, Krishnamurthy numbers, Leyland primes, Parametric solutions