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Proof of Fermat's last theorem for $n = 5$ and many odd primes

C U Ubeynarayana*, K G E U Dharmasiri and R A D Piyadasa
Department of Mathematics, Faculty of Science, University of Kelaniya, Kelaniya,

Fermat's last theorem has been extensively studied in the recent past specially to see whether it can be proved using elementary mathematics. As a result of this, we have Friedman grand conjecture which states that Fermat's last theorem can be proved using elementary mathematics. A famous logician Colin Mctarty has also reached the same conclusion.

It is shown that parametric representation of x, y, z in Fermat's equation corresponding to $n = 5$ can be obtained using the fundamental theorem of algebra. In the next step, a parametric equation related to the integer factors of x, y, z in the Fermat equation is derived. Fermat's last theorem for $n = 5$ is proved by showing that this equation is never satisfied by the integer factors by deriving an apparent contradiction.

Finally, it is shown how standard Barlow relations are used to derive a parametric equation related to Fermat's last theorem for any odd prime p where $2p + 1$ is also a prime. Fermat's last theorem for any odd prime satisfying the above condition is proved using the above parametric equation and the Remainder theorem as in the case of $n = 5$.

u.chalani@yahoo.com Tel: 0112927969