

1135-VS-3147 **Pietro Paparella***, 18115 Campus Way NE, Bothell, WA 98011. *Eisenstein's criterion, Fermat's last theorem, and a conjecture on powerful numbers.*

Given integers $\ell > m > 0$, and a positive integer n , we define monic polynomials X_n , Y_n , and Z_n with the property that μ is a zero of X_n if and only if the triple $(\mu, \mu + m, \mu + \ell)$ satisfies $x^n + y^n = z^n$. It is shown that the irreducibility of these polynomials implies Fermat's last theorem. It is also shown, in a precise asymptotic sense, that for a vast majority of cases, these polynomials are irreducible via Eisenstein's criterion. We conclude by offering a conjecture on powerful numbers. (Received September 26, 2017)