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Squares in Polynomial Product Sequences

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Let F(n) be a polynomial of degree at least 2 with integer coefficients. We consider the products $N_x=prod_{1 \le x} F(n)$ and show that N_x should only rarely be a perfect power. In particular, the number of x le X for which N_x is a perfect power is $O(X^c)$ for some explicit c<1. For certain F(n) we also prove that for only finitely many x will N_x be squarefull and, in the case of monic irreducible quadratic F(n), provide an explicit bound on the largest x for which N_x is squarefull.

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