

Another Proof By Contradiction

Claim: There are infinitely many primes.

Proof:

Suppose for the sake of contradiction, that there are only finitely many primes. Call them p_1, p_2, \dots, p_k .

Consider the number $q = p_1 \cdot p_2 \cdot \dots \cdot p_k + 1$

Case 1: q is prime

Case 2: q is composite

But [] is a contradiction! So there must be infinitely many primes.

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