

Collected Problems:

1. Let $m = 2373147399397166371774039598905033984080129517761100036979041$.
 - (a) Try to show m is composite by factoring it. Stop after 1 minute.
 - (b) Try to show that m is composite using Fermat's little theorem with at least 5 different values of a . You will fail.
 - (c) Try to show m is composite with the Rabin-Miller test with $a = 1511111114$. You will again fail.
 - (d) Show m composite by the Rabin-Miller test with some other a .
2. Find the following values of Möbius function.
 - (a) $\mu(12)$
 - (b) $\mu(123)$
 - (c) $\mu(3715)$
 - (d) $\mu(30030)$
3. Show that if n is a positive integer then $\mu(n)\mu(n+1)\mu(n+2)\mu(n+3) = 0$
4. Prove or disprove that there are infinitely many positive integers n such that $\mu(n) + \mu(n+1) = 1$.