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**Problem 1:** (a) Give a complete statement of Fermat's Little Theorem.

(b) Use Fermat's Little Theorem to compute  $4^{94704} \bmod 101$ . Show your work.

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**Problem 2:** Solve the recurrence  $A_n = 4A_{n-1} + 21A_{n-2}$ , with initial conditions  $A_0 = 0$ ,  $A_1 = 3$ .

(a) Characteristic polynomial and its roots:

(b) General form of the solution:

(c) Initial condition equations and their solution:

(d) Final answer: