

Putnam E.9

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1 Problems

Putnam 1983/A1. How many positive integers divide at least one of 10^{40} and 20^{30} ?

Putnam 1983/A2. A clock's minute hand has length 4 and its hour hand length 3. What is the distance between the tips at the moment when it is increasing most rapidly?

Putnam 1983/A3. Let $f(n) = 1 + 2n + 3n^2 + \cdots + (p-1)n^{p-2}$, where p is an odd prime. Prove that if $f(m) = f(n) \pmod{p}$, then $m = n \pmod{p}$.