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 $m = n \pmod{p}$. 