

Homework

due on Monday, October 5

Problem 1. Let f be a polynomial such that $f(x) - 2f'(x) + f''(x) \geq 0$ for all x . Prove that $f(x) \geq 0$ for all x .

Problem 2. Prove by induction that 5 divides $n^5 - n$ for every natural number n .

Problem 3. Bay Area Rapid Food sells chicken nuggets. You can buy packages of seven or packages of 11. What is the largest integer n such that there is no way to buy exactly n nuggets? Can you generalize this?

Problem 4. Compute $\int_0^2 \frac{x^3 dx}{6x^2 - 12x + 8}$. Hint: expand $(x - 2)^3$?