

UCLA Math Circle, 10/10/10 (Cool, eh?)

Introductory Problems

Problem 1) Prove that every even square is divisible by 4, while every odd square has remainder 1 when divided by 4.

Problem 2) What can we say about the remainder even or odd cubes when divided by 8? What happens if we raise an even (or odd) number to the fourth power, and look at its remainder when divided by 16?

Problem 3) More generally, suppose I start with an integer, n , and raise it to the j -th power. If I divide n^j by 2^j , what remainders might I get?