

Math 331 Spring 2006
Assignment 2: Due by Feb 13

1. Determine if $\log_2 3$ is irrational and prove it.
2. Prove there is no integers x, y and z such that $x^2 + y^2 + z^2 = 999$.
3. Show that

$$(a + b)^n \equiv a^n + b^n \pmod{2}$$

for all a and b and for all $n \geq 1$. And disprove that

$$(a + b)^2 \equiv a^2 + b^2 \pmod{3}.$$