**Assignment 1 – Part 1 – Math 412**

(1) Sums of three squares. In class, we showed that if $n \equiv 3 \pmod 4$, then $n$ cannot be written as a sum of two squares. This question gives a similar result for sums of three squares.

(a) Show that the square of any integer is either $0, 1$, or $4$ modulo $8$.

(b) Conclude that if $n \equiv 7 \pmod 8$, then $n$ cannot be written as a sum of three squares.

(c) Give an example of a number $n \equiv 3 \pmod 4$ that *is* a sum of three squares.