Extra Questions from section 1.1

#8. (a) Divide 5^2, 7^2, 11^2, 15^2, 27^2 by 8 and note the remainder in each case.

(b) Make a conjecture about the remainder when the square of an odd integer is divided by 8.

(c) Prove your conjecture.

#9. Prove that the cube of any integer has to be exactly one of these forms: $9k$ or $9k + 1$ or $9k + 8$ for some integer k.