

HOMWORK ASSIGNMENT # 12

DATE: APRIL 27, 2009 DUE: MAY 4, 2009

Make sure that when you write a complete explanation for the following questions that you clearly write the question itself. Write full sentences and clear reasons. The third question corresponds to question 11.36 in the text *Mathematical Proofs*

- (1) Show that there is exactly one integer which is a square and is 64 more than 3 times a prime number. Tell me what the number is and explain clearly why you know this is the only possible answer.
- (2) Show that an integer is divisible by 3 if and only if the sum of the digits is divisible by 3.
- (3) Prove that if p is a prime and k is an integer such that $k \geq 2$, then $p^{1/k}$ is not rational.