

CS 1155: Understanding and Constructing Proofs

Spring 1999

Home work 1 // Due: Friday, April 9, 1999

- (a) (5 points) Prove that if a positive integer p is not a multiple of 5 then p^2 is also not a multiple of 5.

(b) (10 points) Prove that $\sqrt{5}$ is irrational.
- (10 points) Prove or disprove: If p_1, p_2, \dots, p_n are $n \geq 2$ prime numbers, then $p_1 p_2 \cdots p_n + 1$ is a prime number.
- (15 points) Exercises 1.1, problem 15 (a), (c), and (d), page 9 of the text.
- (20 points) Exercises 1.2, problem 17 (a), (b), (c), and (d), pages 19-20 of the text.
- (10 points) Exercises 1.2, problem 20, page 20 of the text.
- (15 points) Exercises 1.4, problem 6 (a), (b), and (c), page 38 of the text.
- (15 points) Let A be a set consisting of 12 positive integers with each integer ≤ 200 . Show that there are two *disjoint* subsets S and T of A whose elements sum to the same value.