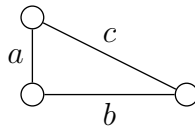


Foundations of Computer Science (COMP109)

Tutorial II (bring solutions between 09.10.2017 – 13.10.2017)

- II.1. Prove for all integers n , if n is even then n^2 is even.
- II.2. Prove for any natural number n that $n^2 + n + 1$ is always odd.
- II.3. Prove by contradiction that there is no greatest even integer.
- II.4. Prove by contradiction that if n is an integer and n^3 is odd then n is odd.
- II.5. Use proof by contradiction to show that if a product of two positive integers is greater than 100 then at least one of the numbers is greater than 10.
- II.6. Prove by contradiction that for any integer k that $6k + 5$ is not divisible by 3.
- II.7. Let a , b , and c be lengths of sides of a right triangle. (You may assume $a, b, c > 0$.)



The Pythagorean theorem states that $a^2 + b^2 = c^2$. Use this fact and proof by contradiction to show that $a + b \geq c$.