CSCI 338 Computer Science Theory

Assignment 1 (10 marks)

Question 1 (1 marks)

Prove that \(1^2 + 3^2 + 5^2 + \cdots + (2n - 1)^2 = \frac{1}{3}n(4n^2 - 1)\).

Question 2 (1.5 marks)

Given a planar graph \(P = (V, E)\), we have Euler’s formula: \(|V| + |F| - |E| = 2\), where \(F\) is the set of faces of \(P\) and \(E\) is the set of edges of \(P\). Let \(|V| = n\), where \(V\) is the set of vertices of \(P\).

Prove that the average degree of the vertices in \(V\) is at most 6.

Question 3 (1.5 marks)

Show that in any simple graph there is a path from any vertex of odd degree to some other vertex of odd degree.

Question 4 (4 marks)

(4.1) Problem 1.6.c, 1.6.f (page 84— all the questions with only numbers given are referred to the 3rd edition of the textbook).

(4.2) Problem 1.7.b, 1.7.c (page 84).

Question 5 (2 marks)

Problem 1.16.a (page 86).

Date Due: before the end of class on Monday, Feb 2, 2015. No late assignment will be accepted.