Graph Theory
Homework Series 01
In Groups of 2-4 Students

Keywords: Basic Notions on Graphs.

Exercise 1. *Let $G = (V, E)$ be a graph. Decide whether the following facts are true or not and prove your answer!*

(i) If G is finite, then E is finite.

(ii) If E is finite, then G is finite.

5 points.

Exercise 2. *Let $G = (V, E)$ be a graph. Show that $|E| \leq \frac{n(n-1)}{2}$.*

5 points.

Exercise 3. *Prove that any graph has an even number of vertices of odd degree.*

5 points.

Exercise 4. *Assume u and v are adjacent vertices in a graph. Show that*

$$N(\{u, v\}) = N[\{u, v\}]$$

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5 points.