

Math 175 - Homework 3

1. Suppose that all of the two element subsets of $[6]$ are colored red or blue. Prove that there is a three element set, all of whose two element subsets have the same color. Show that this is not true for $[5]$.

2. Let $G = (V, E)$ be a graph. Show that

$$\sum_{v \in V} d(v) = 2 \cdot |E|,$$

where $d(v)$ is the degree of the vertex v .