Contents

1 Coloring

Vertex Coloring

Theorem 1.1 (Brook's Theorem)**.** *In a connected graph in which every vertex has at most Δ neighbors, the vertices can be colored with only Δ colors, except for two cases, complete graphs and cycle graphs of odd length, which require $\Delta + 1$ colors.*

1.0.1 Chromatic Polynomial

$$P_G(k) = P_{G_1}(k) + P_{G_2}(k)$$

The first coefficient is always 1.
The degree of the first term is the ($|V|$).
The second coefficient is always $-(|E|)$.
The final (constant) coefficient is always 0.

Definition 1.2. The chromatic polynomial of a complete graph K_n on n vertices is

$$P_{K_n} = k(k-1)(k-2)...(k-(n-1))$$

◇

Definition 1.3. The chromatic polynomial of a tree T_n on n vertices is

$$P_{T_n} = k(k-1)^{n-1}$$

◇

Edge Coloring

Definition 1.4. The chromatic index of a graph, χ', is ... ◇

2 The Next Section

Hello this is another section.