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Problem 1. Let G be a bipartite graph with parts A, B. Suppose that every edge $e \in E$ is assigned a weight $w(e) \in \{\pm 1\}$. We may assign a sign $\sigma(x) \in \{\pm 1\}$ to every $x \in V$ and we define the resulting weight of the edge $e = ab \in E$ to be $w(e)\sigma(a)\sigma(b)$. Prove that we can choose σ so that

$$\sum_{\substack{a \in A, b \in B: \\ ab \in E}} w(ab)\sigma(a)\sigma(b) \geq C \sum_{a \in A} \sqrt{\deg a},$$

for some constant $C > 0$.