CS23 Assignment Five

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1 We often define graph theory concepts using set theory. For example, given a graph $G = (V, E)$ and a vertex $v \in V$, we define

$$N(v) = \{u \in V : \{v, u\} \in E\}$$

We define $N[v] = N[v]U\{x\}$. THe goal of this problem is to figure out what all this means.

a. Let G be the graph with $V = \{a, b, c, d, e, f\}$ and $E = \{\{a, b\}, \{a, e\}, \{b, c\}, \{b, e\}.\{c, d\}, \{c, f\}, \{d, f\}, \{e, f\}\}$. Find $N(a), N[a], N(c), andN[c]$.

b. What is the largest and smallest possible values for $|N(v)|$ and $|N[v]|$ for the graph in part (a)? Explain?

c. Give an example of a graph $G = V, E$ (probably different than the one above) for which $N[v] = V$