

VERTEX COVER

Definition: A **vertex cover** in a graph is a set V_0 of vertices so that every edge in the graph has at least one of its endpoints in V_0 . In other words, a vertex cover is a set $V_0 \subseteq V$ so that $\forall (v, w) \in E, v \in V_0$ or $w \in V_0$.

Decision problem:

- ▶ Input: Graph $G = (V, E)$ and integer k
- ▶ Question: Does G have a vertex cover of size k ?

Optimization problem: Find the size of the smallest vertex cover in the input graph G .

Construction problem: Find the smallest vertex cover in the input graph G .

NOTE: VERTEX COVER is NP-complete (one of Karp's original problems)