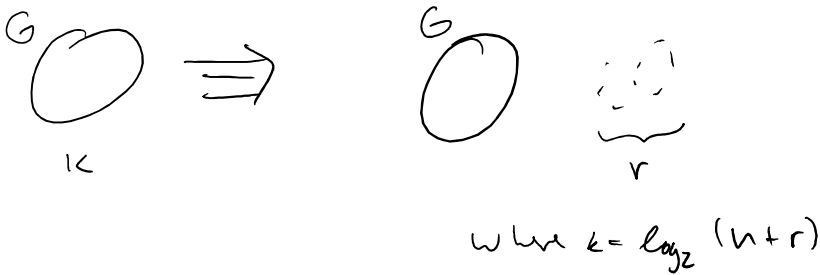


$$\binom{n}{\log_2 n}$$

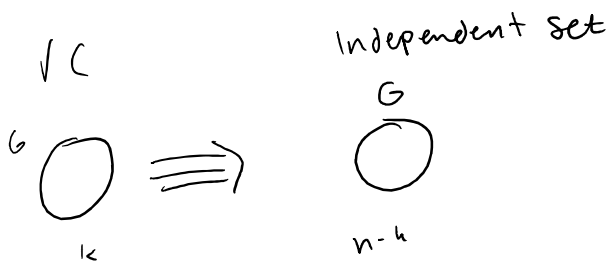
VC \Rightarrow VC w/ $k = \log_2 n$



Independent Set problem:

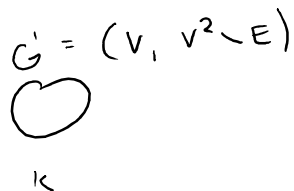
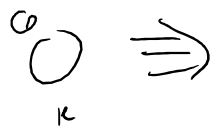
subset of V where no edges btwn vertices.

VC \leq_P Independent Set \leq_P Clique



Independent Set

clique



Graph Coloring

Instance: An undirected graph $G=(V, E)$
and an integer k

Question: does G have a k -coloring, i.e. a
fn $C: V \rightarrow \{1, 2, \dots, k\}$ s.t. if $(u, v) \in E$, $c(u) \neq c(v)$

3SAT \leq_p Graph Coloring

$$E = C_1 \wedge \dots \wedge C_m \implies$$

over vars

$$\{x_1, \dots, x_n\}$$

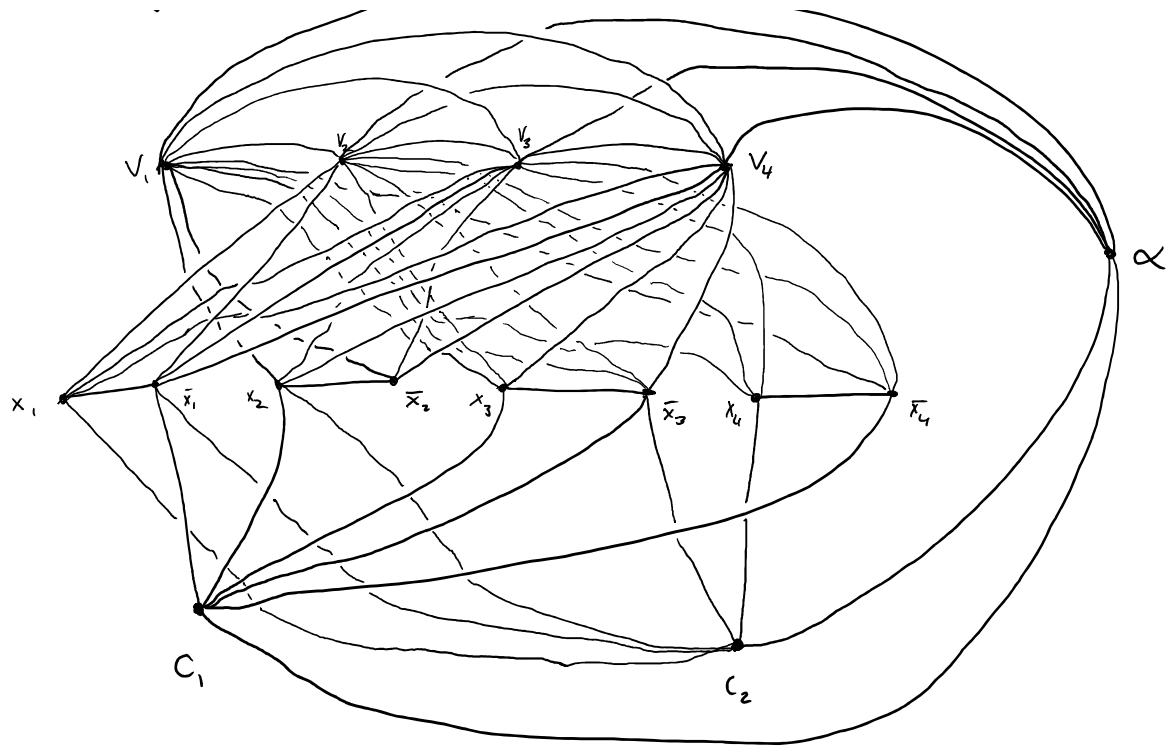
where each

c_j has 3 literals

eg

$$(x_1 \vee \bar{x}_2 \vee x_4) \wedge (\bar{x}_2 \vee x_3 \vee \bar{x}_4)$$





$(n+1)$ -colorable? iff E satisfiable.