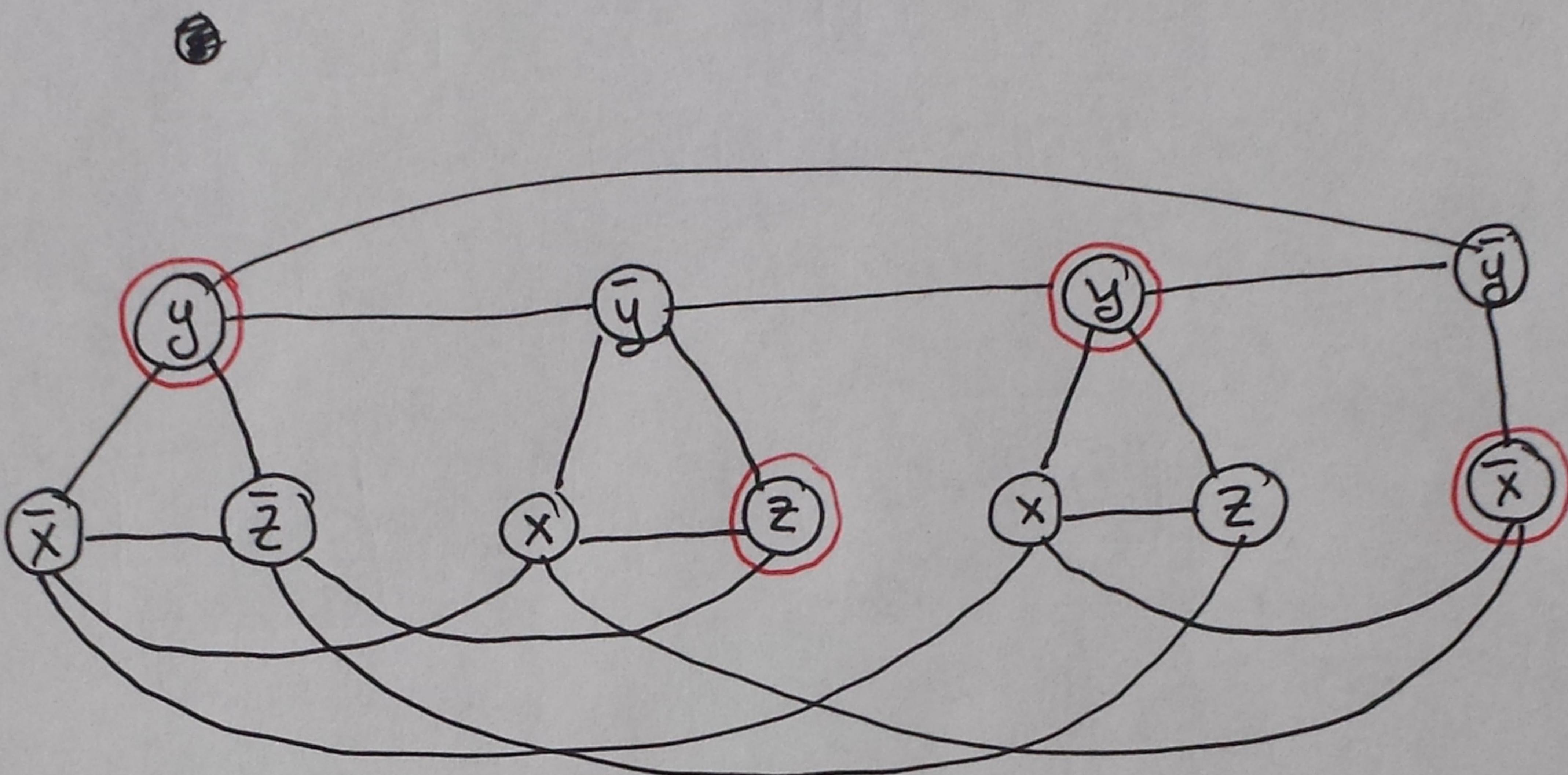
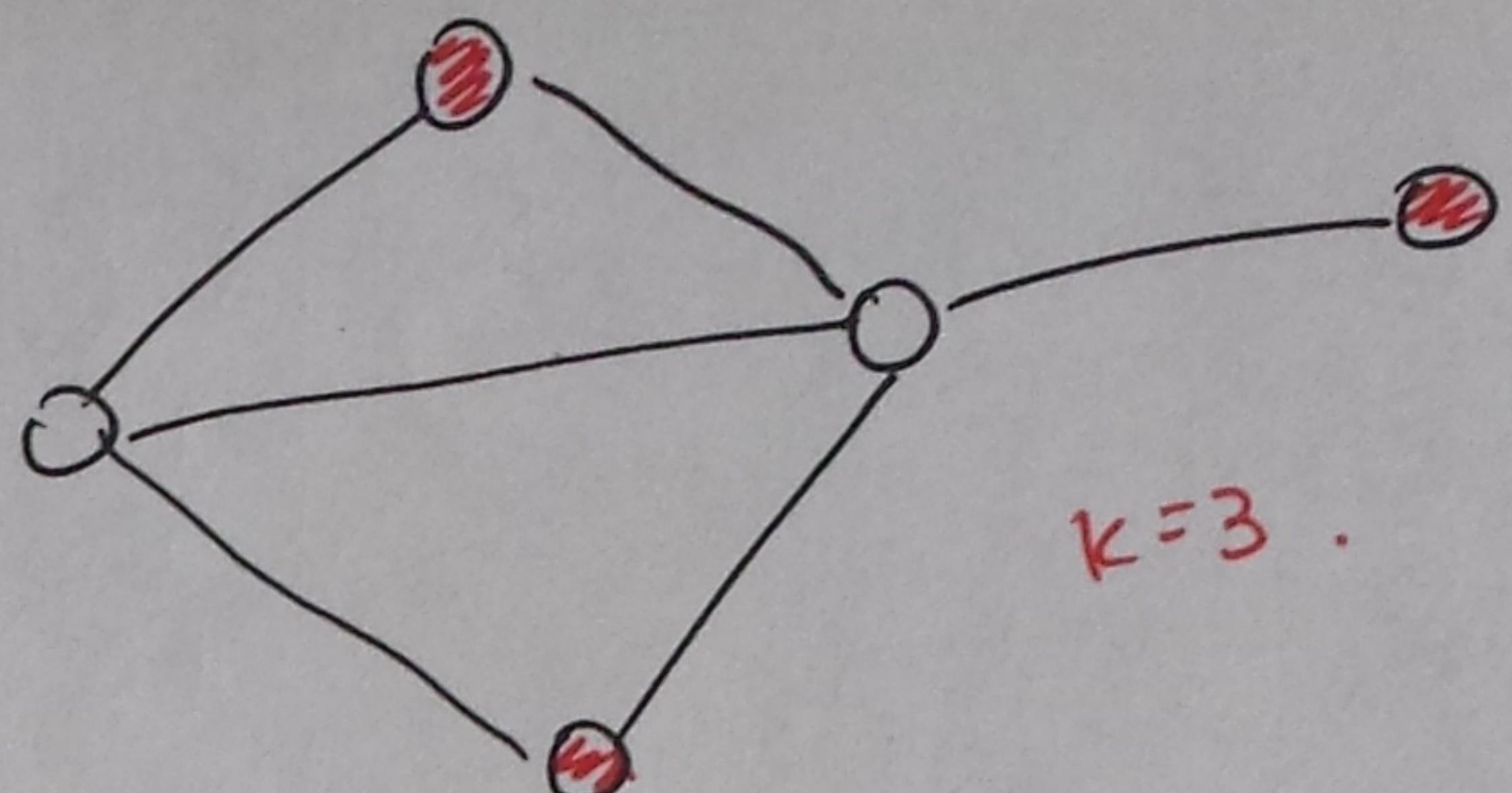


Reduction from 3-SAT to Independent Set.

given a boolean formula,
we are going to build
a graph for an I.S. instance.
 $k = \# \text{ of clauses.}$

given a graph and a number k ,
is there a subset of $\geq k$ vertices,
no two of which are adjacent.



- Create a component for each clause.
- Connect negated literals (in the graph).
- Is there an I.S. $\setminus S$ with $\geq k$ ($\# \text{ of clauses} \rightarrow 4$) vertices.
- To convert to a boolean formula, set literals in S to True.
 $y=1, z=1, \bar{x}=1 (x=0)$.

3-SAT reduces to I.S.

⇒ I.S. is NP-hard.

⇒ I.S. has no poly-time alg. unless $P=NP$.