Complete part (2b) of the following proof.

**Theorem:** CLIQUE is NPC.

**Proof:**

(1) CLIQUE is NP: Given a guess, we can verify in polynomial time that its size is at least $K$ and that for every two vertices, the edge between them is in $E$.

(2) 3DM $\propto$ CLIQUE:

(2a) The transformation:
Let $W$, $X$, $Y$, and $M$ be the input to 3DM. We construct the input to CLIQUE, which consists of a graph $G(V, E)$ and an integer $K$, as follows.

$V = M$.

$E = \{\{m_1, m_2\}: m_1, m_2 \in M \text{ and the triples } m_1, m_2 \text{ are disjoint}\}$

$K = |W|$.

(2b) Equivalence:

See the class notes for a solution.
Complete part (2b) of the following proof.

*Theorem:* FVS is NPC.

*Proof:*

1. \( \text{FVS} \in \text{NP} \): Given a guess, we can verify that its size does not exceed \( K \). We can eliminate the vertices in the guess from the graph, and verify that it is cycle free by performing DFS.

2. \( \text{VC} \preceq \text{FVS} \).

2a) Let the input to VC be a graph \( G(V, E) \) and an integer \( k \). The input to FVS, which is a digraph \( H(U, F) \) and an integer \( K \), is constructed as follows.

\[
U = V.
\]

\[
F = \{ a \rightarrow b, b \rightarrow a : a - b \in E \}.
\]

\[
K = k.
\]

2b) Equivalence:

See the class notes for a solution.