**Geometry**
**Quiz 2**

**Name:**_____

You have 10 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

(1) Define what
   (a) $\Sigma \models \sigma$ means.

   $\Sigma \models \sigma$ means that any structure that satisfies the sentences in $\Sigma$ also satisfies the sentence $\sigma$.

   (b) $\Sigma \vdash \sigma$ means.

   $\Sigma \vdash \sigma$ means that there is a formal proof of $\sigma$ from the assumptions in $\Sigma$.

(2) State Gödel's Completeness Theorem.

Gödel's Completeness Theorem states that if the sentences in $\Sigma \cup \{\sigma\}$ are first-order, then $\Sigma \models \sigma$ if and only if $\Sigma \vdash \sigma$. (Informally this means that exactly one of the following is true: either there is a proof from $\Sigma$ that $\sigma$ holds or there is a counterexample satisfying the sentences in $\Sigma$ but not $\sigma$.)