Show all work. Unjustified answer yields no credit. Assume that \( G = (V, E) \) is a graph.

1. (2 points) Define a trail in \( G \).

2. (6 points) Assume that \( G \) has a maximal nonclosed trail. What is the minimal number of vertices of odd degree \( G \) has? (Justify!) Give an example of \( G \) where this minimum is achieved.

3. (2 points) Assume that \( G \) is a regular graph. When \( G \) is Eulerian?

\[ \text{1. A trail in } G \text{ is a walk that: Each edge appears once. (No edge is repeated)} \]

\[ \text{2. } G \text{ has to have at least two odd degree vertices: the beginning (} u_0 \text{) and the end vertex (} u_k \text{) of a maximal nonclosed trail } T: u_0 \rightarrow u_1 \rightarrow \ldots \rightarrow u_k \text{.} \]

\[ \text{3. } G \text{ is } k\text{-regular and } k \text{ is even, and connected.} \]

\[ \text{Example } G \text{ is a path } u_0 \longrightarrow u_1 \longrightarrow \ldots \longrightarrow u_k \]

\[ \text{So } G(T) = G \text{ and the only odd vertices are } u_0 \text{ and } u_k. \]