Sample Quiz 1

Question 1 Let $x, y, z \in G$ with $d(x, y) = k$ and $z \in \Gamma(y)$. Prove that

$$|d(x, z) - k| \leq 1$$

Question 2 Draw the graph G such that $V(G) = \{1, 2, 3, 4, 5\}$ and

$$E(G) = \{\{i, i + 1\} : 1 \leq i \leq 4\} \cup \{\{2, 5\}\}$$

Decide whether G is connected, tell how many components it has, and then decide whether it has one of each of the following (and give an example if so):

- 3-cycle
- 5-cycle
- 5-circuit

Question 3 Classify the following statements as true or false; for any that are false, give counterexamples in the graph you draw for Question 2.

- Every walk is a trail.
- Every path is a trail.