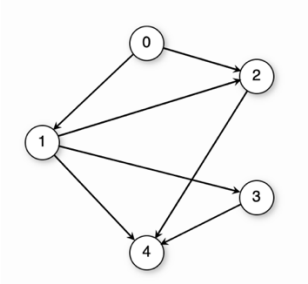
1. True or False. Every tree is a graph, but not every graph is a tree.

2. Select the correct answer. If v denotes the number of nodes/vertices in a directed graph, then the maximum number of edges that could be in the graph is:
    a. O(v^2)
    b. O(logv)
    c. O(vlogv)
    d. O(v)
    e. O(1)
    f. O(v^3)

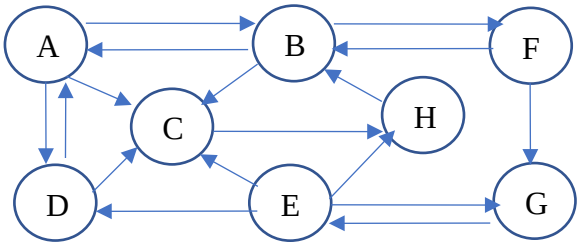
3. Select the correct answer. The number of edges incident to a node is called its:
    a. Degree
    b. Size
    c. Number
    d. Count
    e. None of the above

4. Consider two distinct directed graphs, let's call them Graph 2 and Graph 3. Both graphs have the same number of nodes, but Graph 2 has 10 edges and Graph 3 has 20 edges. Select all of the following that are true.
    a. If using adjacency lists to represent the graphs, Graph 2 will take less memory than Graph 3 will.
    b. If using adjacency matrices to represent the graphs, Graph 2 will take less memory than Graph 3 will.
    c. If using adjacency matrices to represent the graphs, Graph 3 will take less memory than Graph 2 will.
    d. If using adjacency lists to represent the graphs, Graph 3 will take less memory than Graph 2 will.

5. What is the in-degree of node 2?



6. Consider the following graph.
    a. If you were to perform a **depth**-first traversal of the graph, starting at node **E,** what order will the nodes be visited.
    b. If you were to perform a **depth**-first traversal of the graph, starting at node **G,** what order will the nodes be visited.



7. (2 pts) The out-degree of a node u in a directed graph is the number of edges for which u is the source. Write pseudocode that computes the outdegree of a given node in a directed graph represented by the adjacency matrix representation.