

Foundations of Discrete Mathematics
COT 2104
Chapter 9 (Answer_Review)

1. A pseudograph is like a graph, but it may contain loops and/or multiple edges.
 - a. True x
 - b. False

2. Two vertices are said to be incident if there is an edge joining them.
 - a. True
 - b. False x

3. Two vertices are said to be adjacent if there is an edge joining them.
 - a. True x
 - b. False

4. Two edges are said to be adjacent if they have a vertex in common.
 - a. True x
 - b. False

5. The complete graph K_4 has four vertices and four edges.
 - a. True
 - b. False x

6. The complete graph K_4 has four vertices and six edges.
 - a. True x
 - b. False

7. The graph $K_{5,7}$ has 12 vertices and 35 edges.
 - a. True x
 - b. False

8. It is not possible for a graph to have degree sequence 4, 4, 3, 3, 2, 2, 2, 1.
 - a. True x
 - b. False

9. It is not possible for a graph to have degree sequence 6, 5, 4, 3, 2.
- True x
 - False

10. The sum of the degrees of the vertices of a pseudograph is an even number equal to twice the number of edges.

$$\sum_{v \in V} \deg v = 2 | E |$$

- True x
- False

where $G(V, E)$

11. A graph G_1 is a subgraph of another graph G if and only if the vertex and edge sets of G_1 are, respectively, subsets of the vertex and edge sets of G .

- True x
- False

12. If graphs G_1 and G_2 are isomorphic and pictures are drawn for each of these graphs, then the pictures must look the same.

- True
- False x

13. If G_1 and G_2 are isomorphic graph, then G_1 and G_2 have the

- * the same number of vertices
- * same number of edges
- * same degree sequences

- True x
- False

14. If pictures drawn for G_1 and G_2 look the same, then G_1 and G_2 are isomorphic.

- True x
- False

15. $K_{2,3}$ is isomorphic to $K_{3,2}$.

- True x
- False

16. $K_{2,3}$ is isomorphic to K_5 .
- True
 - False x
17. If graphs G_1 and G_2 have the same number of vertices, then G_1 and G_2 are isomorphic.
- True
 - False x
18. If graphs G_1 and G_2 have the same number of edges, then G_1 and G_2 are isomorphic.
- True x
 - False
19. If graphs G_1 and G_2 are isomorphic, then G_1 and G_2 have the same degree sequences.
- True x
 - False
20. Isomorphism is an equivalence relation on the set of all graphs.
- True x
 - False
21. If graphs G_1 and G_2 are isomorphic, G_1 has vertices $\{v_1, v_2, \dots, v_n\}$ and G_2 has vertices $\{w_1, w_2, \dots, w_n\}$, then the degree of vertex v_1 equals the degree of vertex w_1 .
- True
 - False x

