1. g(a) = (1, 2)

g(b) = (2, 2)

g(c) = (2, 3)

g(d) = (1, 3)

1. a. The graph is simple.

b. The graph is not complete.

c. The graph is connected.

d. 3 -> 5 -> 6

3 -> 4 -> 5 -> 6

e. yes 3 -> 4 -> 5 -> 3

f. yes, the edge would be a5.

g. yes, the removal of edge a1 will make the graph not connected.

5.

9. a. This implies that the IT and the marketing department are two separate departments that do not relate to each other so there is no path connecting them.

b. Carl and Fletcher are not acquainted. SiuYin is acquainted with one person.

c. The degree of separation between Carl and Yuri is 2.

13. Graph b is not isomorphic because graphs a and c have an isolated vertex, while this graph does not have an isolated vertex.

30. Euler’s formula: 4 \* n = 2 \* 12