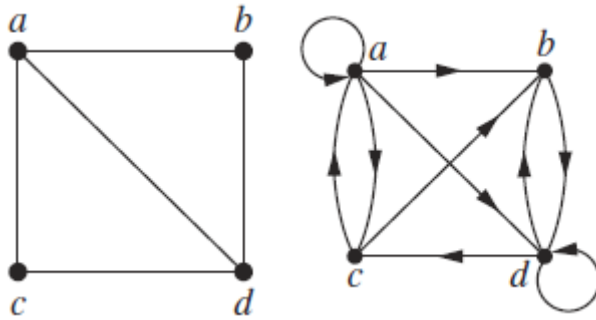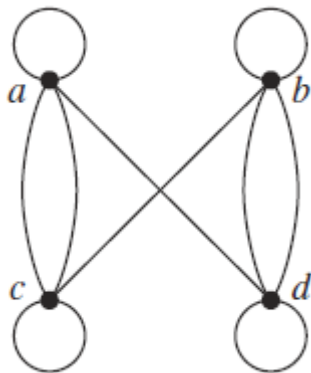# Exercise 3

1. Use an adjacency list and an adjacency matrix to represent the given graph.

2. Draw a graph with the given adjacency matrix.

$$\begin{bmatrix} 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix} \quad \begin{bmatrix} 1 & 2 & 1 \\ 2 & 0 & 0 \\ 0 & 2 & 2 \end{bmatrix}$$

3. Use an incidence matrix to represent the graphs

4. What is the sum of the entries in a row of the adjacency matrix for an undirected graph? For a directed graph?

What is the sum of the entries in a column of the adjacency matrix for an undirected graph? For a directed graph?

What is the sum of the entries in a row of the incidence matrix for an

undirected graph?

What is the sum of the entries in a column of the incidence matrix for an undirected graph?

5. Determine whether the given pair of graphs is isomorphic. Exhibit an isomorphism or provide a rigorous argument that none exists.
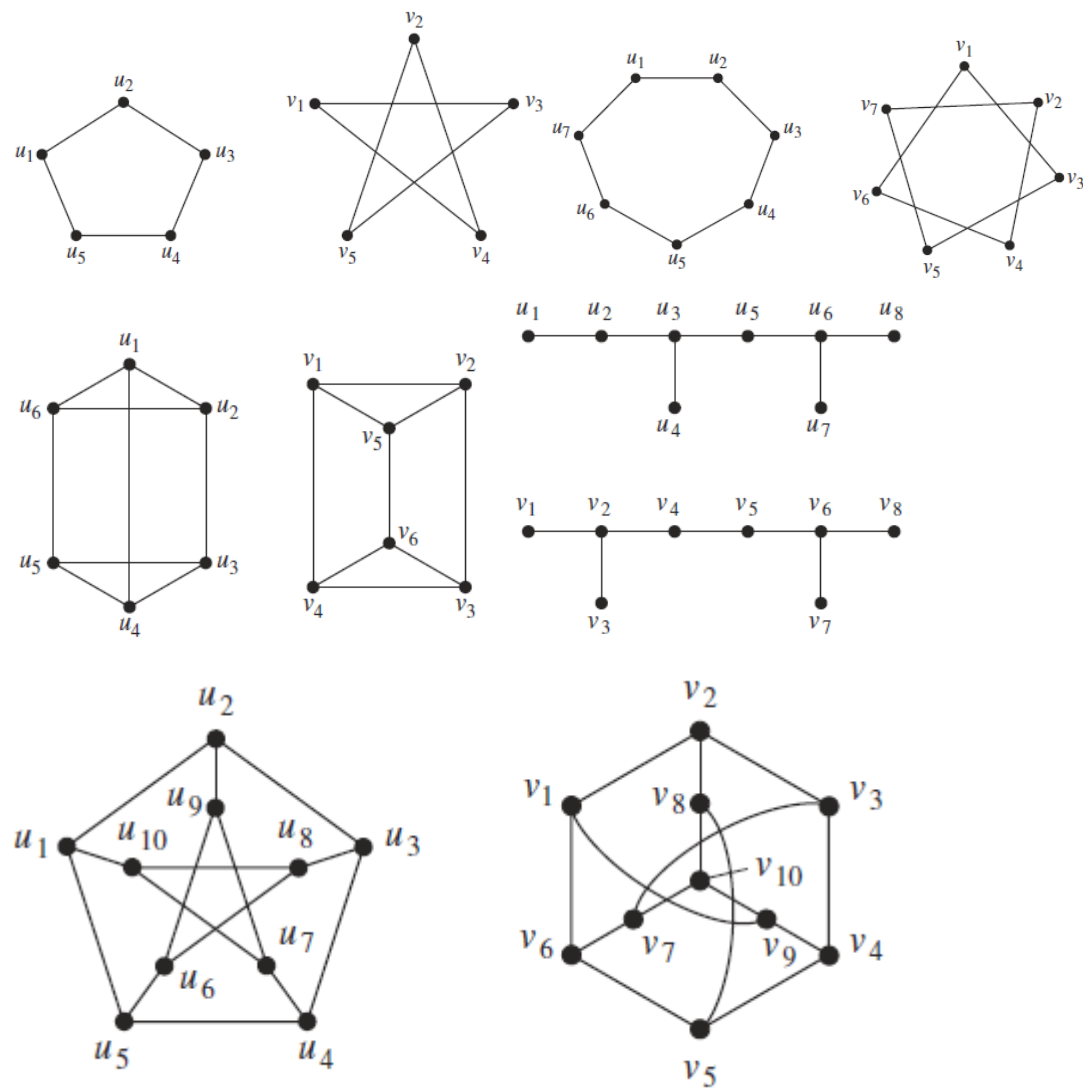
6. How many nonisomorphic simple graphs are there with n vertices, when n is

a) 2?   b) 3?   c) 4?