1. §4.2B: 3(ii).

2. §4.3B: 2(i), 3(i).

3. Each of the following can be modeled by a graph or a multigraph. Explain what the vertices would represent and what the edges would correspond to.

   (a) A molecule

   (b) A family tree

   (c) Jobs and applicants for those jobs

4. Digraphs can be used to describe the structural hierarchy in a corporation (that is, the chain of command). Each employee corresponds to a vertex of the digraph. if u is the direct superior of v, there is an arrow from u toward v. Draw the digraph for the following corporate structure:

   The chairman of the board c is the boss of the president p, who has three vice presidents under his direct control: vice president of finance f, vice president for administration a, and vice president for sales s. The vice president for finance is in charge of the controller t and the manager for research r.

5. What are the sets $A(a)$ and $B(a)$ in the digraph above?

6. Does the above digraph have a source or a sink? If so, what is it? (or what are they?)

7. Is it possible to draw a graph on six vertices with each vertex having degree 3? If so, draw it. If not, why not?