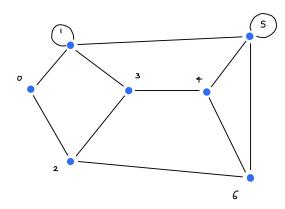
Name:	
Due: 06/09	

ESMI Applied Math Worksheet 3

**Problem 1.** Compute the following matrix-matrix product  $\begin{bmatrix} 1 & 0 & 2 & 2 \\ 1 & 1 & -1 & -1 \\ 0 & 0 & -1 & 1 \end{bmatrix}$   $\cdot \begin{bmatrix} 1 & 0 & 2 \\ 1 & 1 & -1 \\ 0 & 0 & -1 \\ 1 & 1 & 1 \end{bmatrix}$ .

**Problem 2.** What is the degree of each node of a fully connected graph with 3 nodes with self loops? What is the degree of each node of a fully connected graph with 5 nodes without self loops?

**Problem 3.** Consider the graph below and answer the following questions.



- (a) Is the graph directed or undirected?
- (b) What is the degree of node 2?
- (c) Draw a shortest path between nodes 0 and 6. What is the length of this shortest path? Is this shortest path unique (is there another path with the same length)?
- (d) Draw a shortest path between nodes 2 and 5. Is there another shortest path? What is the length of this shortest path? Is this shortest path unique (is there another path with the same length)?
- (e) Compute the adjacency matrix for the above graph.