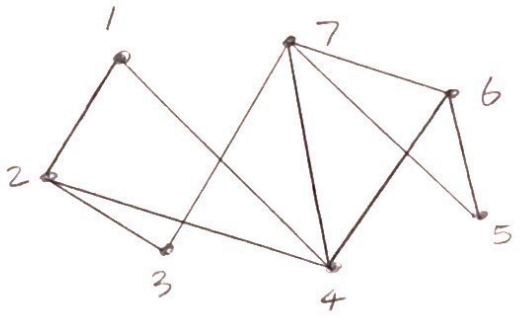
Exercise 19.1



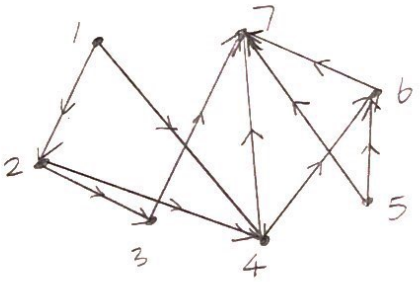
19.2 It is connected, but it's not a complete graph.

It is connected because there is a path between each pair of distinct vertices.

It is not a complete graph because, for example, there is no edge between vertice 1 and 7, 4 and 5.

19.3 Three cycles: 1, 2, 4
4, 6, 7
5, 6, 7

19.5



19.6 It is not connected and not complete.

It is not connected because there is no path from any other vertex to vertex 1 and 5.

It is not complete because a complete directed graph requires every pair of distinct vertices to be connected by a pair of unique edges (one in each direction).

19.7 There is no cycles in this graph.

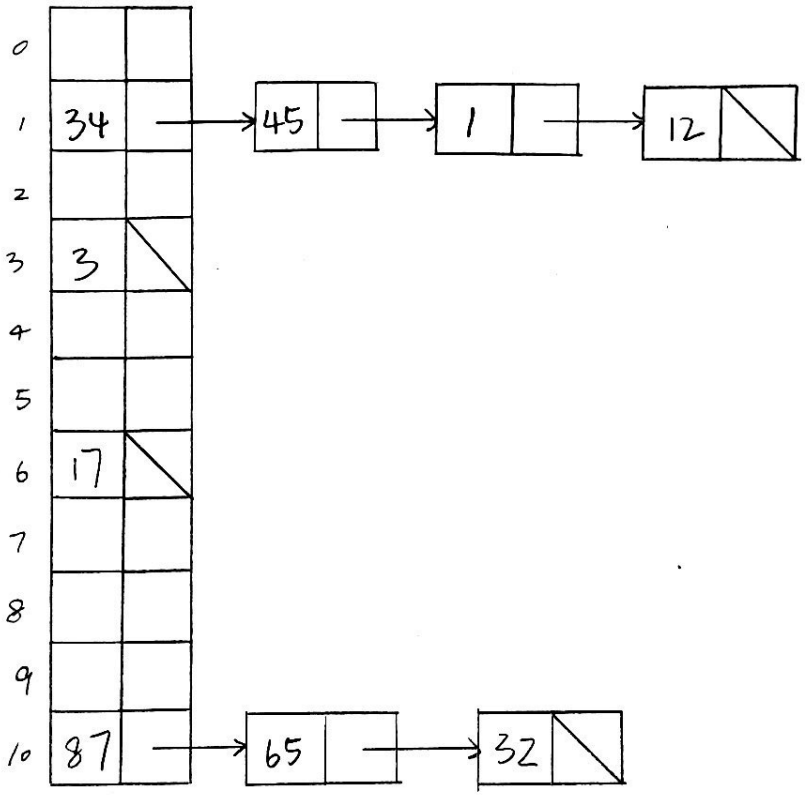
19.9 Possible paths: weights:

$2 \xrightarrow{3} 5 \xrightarrow{1} 3$ $3+1=4$

$2 \xrightarrow{8} 4 \xrightarrow{11} 3$ $8+11=19$

$2 \xrightarrow{12} 1 \xrightarrow{6} 4 \xrightarrow{11} 3$ $12+6+11=29$

20.1



20.3

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
34	1	87	3	17							45	12		65	32	