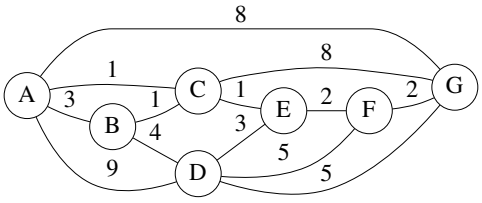
Name: _____

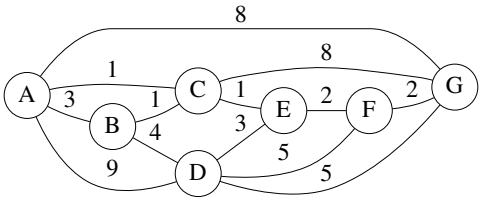
1. (1 pt.)
   - **Read all material carefully.**
   - *If in doubt whether something is allowed, ask, don't assume.*
   - You may refer to your books, papers, and notes during this test.
   - No computer or network access of any kind is allowed (or needed).
   - Write, and draw, carefully. Ambiguous or cryptic answers receive zero credit.
   - Use class and textbook conventions for notation, algorithmic options, etc.

   Write your name in the space provided above.

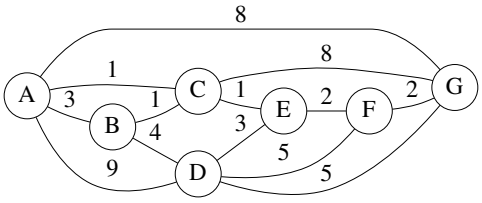
2. (7 pts.) Depict the adjacency list and adjacency matrix representations of the following undirected graph, following the classroom conventions.



[additional space for answering the earlier question]



3. (8 pts.) Trace the operation of BFS, with initial vertex A, on the graph of Question 2 (also below) using the conventions of Figure 22.3 in the textbook. **In addition**, depict the state of the queue at each step (as done in class).



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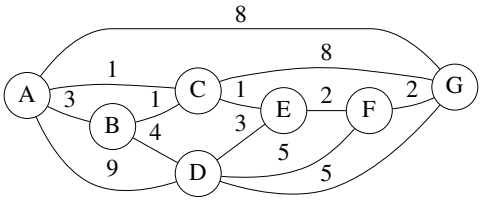
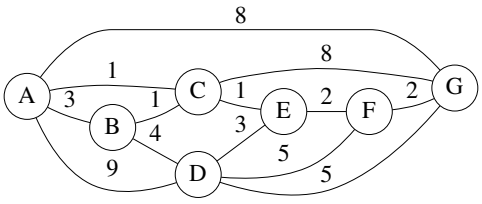


4. (14 pts.) Trace the operation of MST-Kruskal on the graph of Question 2 (also below) using the conventions of Figure 23.4 (p. 632) of the textbook. In particular:

   - depict the state of the algorithm after each iteration of the second for loop;
   - highlight edges belong to the forest A using double-lines; and
   - draw an arrow pointing to the edge under consideration.



[additional space for answering the earlier question]