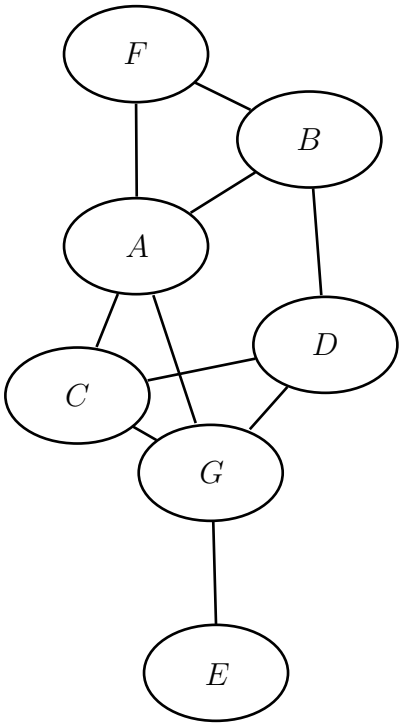
Due by 1559 AST Thursday, February 3, 2011 — Show your work

1. For the given graph, answer the following questions:
   (a) What is the vertex set?
   (b) What are the edges?
   (c) Does the graph have any loops?
   (d) Does the graph have any parallel edges?
   (e) Is the graph simple?
   (f) Is the graph bipartite?
   (g) What are the degrees of the vertices?
   (h) What is the total degree of the graph?



2. Draw a graph with two connected components with:
   (a) $V = \{A, B, C, D, E, F\}$,
   (b) 9 edges,
   (c) 1 loop, and
   (d) 1 pair of parallel edges.

   What is the total degree of your graph?

3. Draw (unlabelled representations of) K_1, K_2, K_3, K_4, and K_5.

4. Draw (unlabelled representations of) $K_{1,1}$, $K_{1,2}$, $K_{1,3}$, and $K_{2,2}$.

5. For the following degree sequences: draw a simple graph if possible, or a non-simple graph if necessary, or lastly, state that no such graph can be drawn.

   (a) $(0, 1, 2, 2, 3)$

   (b) $(0, 1, 2, 3, 4, 5)$

   (c) $(5, 5, 5, 5)$