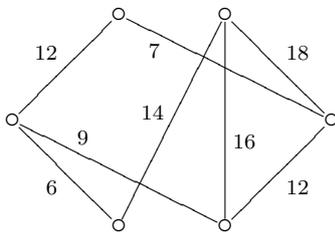


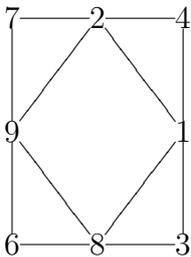
1. (2 points) The degree sequence of G is $(5, 3, 3, 2, 1, 1, 1)$. Find $|E_G|$.
2. (2 points) The graph G has 10 vertices and 14 edges. Find $\deg \bar{G}$.
3. (2 points) A plane graph G has 10 vertices and degree 32. Find the number of regions.
4. (3 points) Draw the the minimal spanning tree and find its total weight.



5. (4 points) Given the adjacency matrix A of a graph, find the number of triangles.

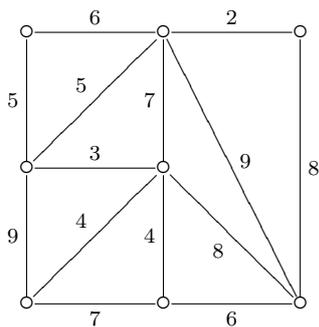
$$A = \begin{bmatrix} 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 1 \\ 1 & 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{bmatrix}$$

6. (4 points) Draw the rooted spanning tree starting at vertex 6 using (a) Breadth-First Search and (b) Depth-First Search algorithm.

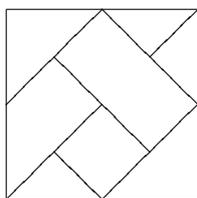


7. (3 points) Prove that \bar{P}_8 is not planar using Euler's test.

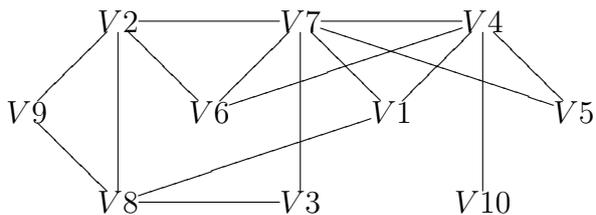
8. (4 points) Draw 3 Hamilton cycles and compute the total weight.



9. (4 points) Draw the dual graph G' and determine $\chi(G')$.



10. (6 points) Color the graph G using (a) Sequential Coloring algorithm and (b) Welsh-Powell algorithm and (c) determine $\chi(G)$.



11. (6 points) Prove planar or not planar by using a Hamilton cycle.

