1. (16 points) A graph $G$ is drawn below. Label each vertex with its eccentricity.
   State the radius and diameter of $G$. Indicate the center of $G$.

2. (6 points) Decide if the sequence $s : 4 \ 4 \ 4 \ 4 \ 3 \ 2$ is graphical. Show your work and/or explain your reasoning.
3. (16 points) Suppose $G$ is a graph of order $n$, and $\deg(v) \geq \frac{n - 1}{2}$ for every $v \in V(G)$. Prove that $G$ is connected.
4. (10 points) Let $G$ be a connected graph on at least three vertices, and let $e = uv$ be a bridge of $G$. Show that either $u$ or $v$ is a cut vertex of $G$.

5. (12 points) What does it mean for a graph to be reconstructible? Give an example (with explanation) of a graph of small order that is not reconstructible.
6. (12 points) Consider the Petersen Graph, sketched below.

Supply the following numeric information. (For this problem you do not have to justify your answers.)

(a) The connectivity is \( \kappa(G) = \)
(b) The edge-connectivity \( \kappa_1(G) = \)
(c) The toughness is \( t(G) = \)

7. (6 points) Suppose a forest has 1000 vertices and 800 edges. How many components does it have?
8. (12 points) Suppose $G$ is a planar graph with 16 vertices, each of degree 4. It is embedded in the plane so that every region is either a triangle or a quadrangle. How many triangles and how many quadrangles does this embedding have? Explain.

9. (10 points) Establish the planarity or non-planarity of this graph. If it is planar, provide a rectilinear plane drawing.