Name: _____

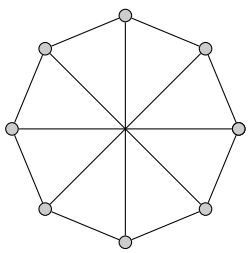
**Directions:** Show all work. No credit for answers without work.

1. **[2 points]** Draw a graph with 5 vertices in which 2 vertices have degree 4, and 2 vertices have degree 3, and 1 vertex has degree 2.

2. **[1 point]** Suppose $G$ is graph with 20 vertices in which every vertex has degree 14. How many edges does $G$ have?

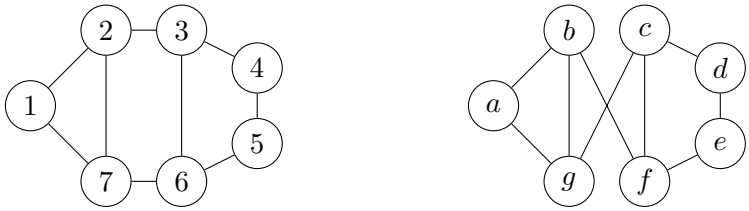
3. **[1 point]** Give a simple argument that there is no 7-regular graph with 15 vertices.

4. **[2 points]** Find a cycle of length 7 in the following graph:



5. **[2 parts, 2 points each]** Decide whether the following pairs of graphs are isomorphic. If they are isomorphic, give the function that establishes the isomorphism. If not, explain why.

(a)




(b)