Homework 5  
Math 3012-N  
Due: Friday, October 2, in class or in office hours

Please submit **hard copies** only. Staple and remove fringe. The deadline of 12:00 p.m. is sharp.

1. Which of the following pairs of graphs are isomorphic? Either find an isomorphism, or prove there isn’t one.

   (a)

   ![Graph A](image1)

   (b)

   ![Graph B](image2)

   (c)

   ![Graph C](image3)

2. Do Exercise 5.9 #7.

3. Do Exercise 5.9 #8.

4. Do Exercise 5.9 #10.
5. An Eulerian trail is like an Eulerian circuit, except we do not require that a trail starts and ends at the same vertex. That is, an Eulerian trail is a walk through a graph, starting at any vertex and ending at any vertex, where every edge is used exactly once. Prove or disprove: A graph \( G \) has an Eulerian trail if and only if it is connected and has at most two vertices of odd degree.

6. Do Exercise 5.9 #12.

7. Do Exercise 5.9 #14.

8. What is \( \omega(G) \) in the following graphs?

![Graphs](image_url)

(a)  (b)  (c)

9. Draw a graph where \( \chi(G) = 4 \) and \( \omega(G) = 3 \).

10. Do Exercise 5.9 #28.