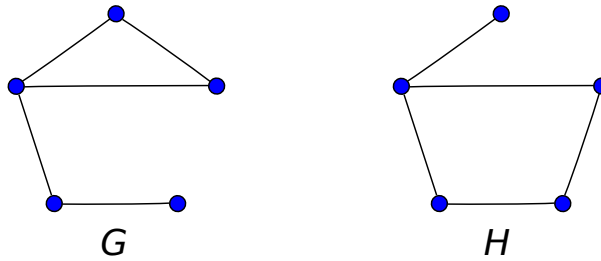


Name:

MIDTERM #1

1. [5 pts] See the graphs G and H in the figure. Determine whether \overline{G} (the complement of G) and H are isomorphic.



2. [5 pts] a) A tree on 8 vertices has vertex degrees

4, 3, 2, 1, 1, 1, 1, x .

Determine the missing degree x . (Hint: Use the handshake lemma.)

- b) Draw an arbitrary tree whose vertices have the given degrees (including x).

3. [5 pts] Using the Havel–Hakimi-algorithm, decide whether the following sequence can be realized by a simple graph or not: 6, 5, 5, 4, 3, 2, 1, 0.

4. [5 pts] Prove that if the simple graph G has $2n$ vertices and every vertex of G has degree at least n , then G is connected.

Hint: By way of contradiction, assume that G is not connected, and consider its components.

5. [5 pts] Find the 10-vertex labeled tree whose Prüfer code is

7, 3, 10, 7, 4, 3, 6, 3.

(Hint: Check your solution.)