

MATH314 HW 3

due **Feb 4** before class, **answer without justification will receive 0 points**. The typing the HW in \LaTeX is optional.

If question has (No drawing), you must presents a writeup that is complete and correct without using a picture. If you add a figure to (No drawing) question, it will not be treated negatively but you should not refer to it in the solution.

- 1:** Give an example of three graphs of the same order, same size and same degree sequence such that no two of these graphs are isomorphic.
- 2:** Does there exist a disconnected self-complementary graph?
- 3:** Let G and H be two self-complementary graphs with disjoint vertex sets, where H has even order n . Let F be the graph obtained from $G \cup H$ by joining each vertex of G to every vertex of degree less than $n/2$ in H . Show that F is self-complementary. (No drawing)
- 4:** How many (non-isomorphic) graphs have the degree sequence $s: 6, 6, 6, 6, 6, 6, 6, 6, 6, 6$?
- 5:** Count the number of automorphisms (that is isomorphism to itself) of the Petersen graph.
- 6:** Let A be the adjacency matrix of a graph G , where G is a triangle-free graph (that is, no K_3 as a subgraph). What are entries of the diagonal of A^3 ?