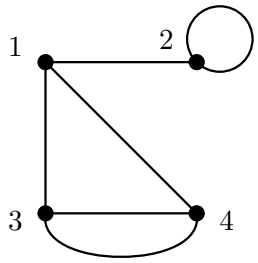
**Name:** _____

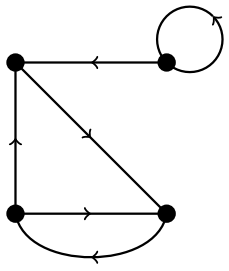
**MATH 107**
**Winter 2022**
**HW 14: Due 01/13**

*"Geometric diagrams are to geometers what board and pieces are to chessmasters: visual aids, helpful but not indispensable."*
*–Richard J. Trudeau*

**Problem 1.** (10pt) Find the adjacency matrix for the graph below:



**Problem 2.** (10pt) Find the adjacency matrix for the graph below:



**Problem 3.** (10pt) Draw the graph whose adjacency matrix is given below:

$$\begin{pmatrix} 0 & 1 & 0 & 2 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \\ 2 & 0 & 1 & 0 \end{pmatrix}$$

**Problem 4.** (10pt) The adjacency matrix of a graph is given below:

$$\begin{pmatrix} 0 & 1 & 2 & 1 \\ 0 & 1 & 1 & 0 \\ 1 & 2 & 0 & 1 \\ 1 & 2 & 0 & 0 \end{pmatrix}$$

(a) Is the graph directed or undirected? Explain.

(b) Are there loops in the graph? Explain.

(c) How many vertices did the graph have? Explain.

**Problem 5.** (10pt) Find the number of walks of length 2 from $a$ to $c$.