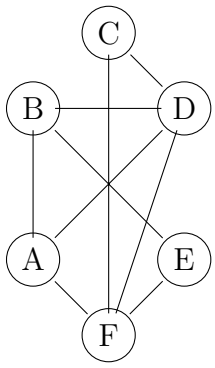
Math 1010 Assignment 4

Due 9:30pm Wed, 15th June

1. Consider the following graph:



   (a) Write the adjacency matrix for the above graph.

   (b) Using the adjacency matrix, how many routes of length 2 are there from vertex B to vertex F?

   (c) How many routes of length 2 or less are there between vertex B and vertex F?

2. Given the adjacency matrix

$$\begin{bmatrix} 1 & 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 \end{bmatrix}$$

   (a) Draw the associated digraph. Label the vertices A, B, C, D and E.

   (b) How many routes of length 2 from vertex D to vertex D?

   (c) How many routes of length 2 or less from vertex B to vertex E?

3. A man invests \$1,400 in a bank with 7.1384% compound interest. How many times must it be compounded per year in order for the investment to reach \$2000 in 5 years?

4. A girl wants to invest all her savings in a local credit union for the next 5 years. She has \$2,100. The credit union offers her two options:

- A savings account with simple interest of 12%
- A savings account with compound interest of 9.5% compounded monthly

(a) Which of the above options should she choose?

(b) How much will she save by going with your choice?

5. You have become tired of Winnipeg and wish to go on a long holiday travelling the world. You estimate the cost of your holiday to be \$10,000. After reviewing your finances, you decide that you can afford place \$140 per month into an annuity account paying 4% interest compounded monthly. How long (in years) until you have enough money to go on your holiday?