Academic Honesty Policy: Students at the University are expected to be honest and forthright in their academic endeavors. To falsify the results of one’s research, to steal the words or ideas of another, to cheat on an examination, or to allow another to commit an act of academic dishonesty corrupts the essential process by which knowledge is advanced. It is the official policy of the University of Delaware that all acts or attempted acts of alleged academic dishonesty be reported to the Dean of Students Office.

By signing below, I acknowledge that I have read the above and that I have neither given nor received assistance on this examination.

All cellular phones and/or electronic devices of any kind must be turned off and put away. You should check your phone now. If your phone rings during the exam, you may be asked to leave.
Exam Instructions: You have the entire period to complete this exam. Upon completion, printout your work and staple this question sheet to the front of your printout. YOU SHOULD SAVE YOUR WORK OFTEN TO ENSURE YOU DO NOT LOSE IT!

Problem 1

Using the polarplot command, plot a 3 petaled rose, a 4 petaled rose, and a circle on the same axes.

Problem 2

Show that $e^{ix} = \cos(x) + i \sin(x)$ by using the taylor and convert commands.

Note: $i$ is the imaginary unit, that is $i = \sqrt{-1}$ and is implemented in Maple by typing a capital 'I'.

Problem 3

Consider the following series:

$$\sum_{m=0}^{\infty} \frac{(-1)^m}{m!(m+1)!} \left(\frac{x}{2}\right)^{2m+1}$$

a) Show that the series converges for all $x$.

b) For $x = 1$, plot the first ten terms.