Directions: You should think of this assignment (and others that will follow) as an opportunity to demonstrate your best work. Solutions should be clearly organized, explained with appropriate comments, and all computations should be carefully checked for accuracy. Sloppy work will not be accepted, and partial credit will generally not be given. Unless otherwise specified, these problems are intended to be done using Maple, and you are expected to submit your solutions in the form of a printed Maple worksheet.

These problems will be due (in recitation) on Thursday, October 23. Late papers will not be accepted.

#1. Plot the graphs of \( f(x)=1+\sqrt{4-x^2} \) and \( g(x)=1-\sqrt{4-x^2} \) over the interval \([-2,2]\). Then use the multiple plot feature that permits plotting both graphs simultaneously. Explain the relationship between these graphs and the graph of the circle \( x^2+(y-1)^2=4 \).

#2. Plot the graph of each of the following rational functions. In each case choose a graph window that reveals the most interesting features of the curve.

(a) \( f(x)=\frac{x^2}{x^2-9} \)

(b) \( f(x)=\frac{4x-7}{(x-1)(x+2)} \)

(c) \( f(x)=\frac{x}{x^3-6x^2+11x-6} \)

(d) \( f(x)=\frac{3x^2+5}{2x^2+3x-2} \)

#3. (a) Plot the graph of \( y=x^3-x+3 \). Zoom in (i.e. adjust the horizontal and vertical ranges) until you obtain a plot window that reveals all of the more interesting features of the graph.

(b) Continue to zoom in until you are able to “read” from your graph an approximation of the value of the x-intercept (solution of the equation \( x^3-x+3=0 \)) with accuracy to at least one decimal place (nearest tenth).

Policy on Group Work - Honor Code

Working together in teams or two or (at most) three students (all from the same recitation section) is permissible and encouraged. You can learn a lot from each other, and the practice of group work (which is the norm in the professional workplace) is also a useful experience. Such a team will submit one paper, and each team member will receive the same grade on the assignment. When submitting your work, be sure to clearly indicate the name and section number of each team member.

Discussing the assignment with other students, or teams of students, is also permissible. However, when it comes time to prepare the worksheet you will be submitting, you should
do so individually (within your team) - in your own style and words, and reflecting your particular way of looking at the problem. We will not accept work where (in our best judgment) this code has been violated.