

Please review the course homework policies and don't forget a cover sheet!

In this course you will need to plot a wide variety of functions, using a variety of visualization techniques that go beyond what you have done in previous Calculus courses. Not all software is equally good at all things, see the *Handout on Calculating and Plotting* for more details. Whenever you use a computer to calculate or plot you need to say what program/software you are using to do the plot. Ideally you will also include all or part of the code you used. To get the experience, you may wish to do these problems more than once, using different software.

- (1) Create plots of the following functions, as indicated.
  - (a) The curve  $g(t) = (t \cos t, t \sin t)$  for  $0 \leq t \leq 2\pi$  in the plane.
  - (b) The scalar field  $f(x, y) = x^2 + y^2$ . This should appear as concentric bands of color.
  - (c) The vector field  $F(x, y) = (-y, x)$ . This should appear as arrows that seem to point in counter-clockwise circles.
  
- (2) Many of the integrals we encounter in this course cannot be (easily) computed using techniques from Calculus I. Use a computer to find numerical approximations to the following definite integrals. See the *Handout on Calculation and Visualization* for more details. Whenever you use a computer to calculate or plot you need to say what program/software you are using to do the plot.
  - (a)  $\int_0^2 \pi \cos(t^2) dt$
  - (b)  $\int_0^5 \frac{1}{\sqrt{1+t^2}} dt$
  - (c)  $\int_0^4 \int_0^x \sqrt{1+y^2} dy dx$