Instructions: We encourage you to work with others in your assigned group on this project. You should write your solution neatly using complete sentences that incorporate all symbolic mathematical expressions into the grammatical structure. Include enough detail to allow a fellow student to reconstruct your work, but you need not show every algebraic or arithmetic step. It is required that you do your own writing, even if you have worked out the details with other people. All graphs should be done carefully on graph paper or drawn by a computer. This project is due at the beginning of class on Tuesday, February 19.

1. Consider a uniform, solid cone of mass M, radius R, and height h.

    (a) Find the rotational inertia of the cone about its axis of symmetry.

    (b) Compare your result in (a) with the rotational inertia of a uniform solid cylinder with mass M, radius R, and height h. How do the different results for the cone and cylinder make sense?

2. Estimate the double integral

$$\iint_R e^{-x^2 y^2} \, dA$$

where $R = [0, 1] \times [0, 2]$. Use 10 subintervals of equal length for the x-interval and 10 subintervals of equal length for the y-interval. Strive for the most accuracy you can obtain with these numbers of subintervals.