Project 1

For this project, your solutions should be written up neatly and completely on separate sheets of paper, with this page stapled on top.

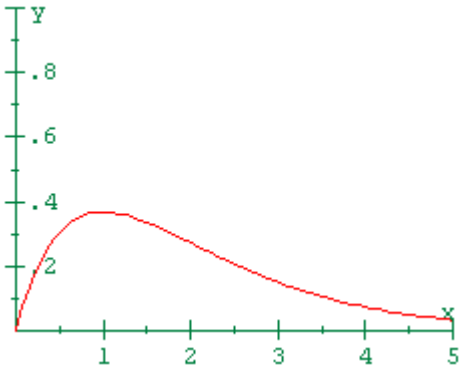
The **centroid** of a region is its center of mass. It is the point $(\bar{X}, \bar{Y})$, where

$$\bar{X} = \frac{1}{A}\int_a^b xf(x)\,dx$$

$$\bar{Y} = \frac{1}{A}\int_a^b \tfrac{1}{2}[f(x)]^2\,dx$$

and *A* is the area of the region, given by $A = \int_a^b f(x)\,dx$.

1. Find the centroid of the region bounded by $y = xe^{-x}$, $x = 0$, $x = 4$ and $y = 0$.



2. Find the centroid of the region bounded by $y = \sin x \cos x$, $x = 0$, $x = \pi/4$ and $y = 0$.