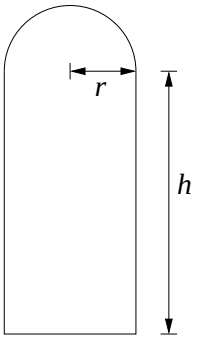
MATH 115-018 QUIZ 11 / 7 Apr 2005 Name:_____

1. (3 points) A stained glass window is to be made in the shape shown to the right, with a rectangular section surmounted by a semi-circular top. If P ft of border material are available, what should the dimensions of the window be to maximize its area? (You may assume that $P > 2$. The circumference of a circle is $C = 2\pi\, r$.)



2. (2 points) Suppose that the velocity of an orange-and-chartreuse-clothed math professor gradually increases in the course of a class period, and is given (in meters/second) by $v(t) = 2\,e^{t^2}$ (where t is in hours). Use a Riemann sum with $\Delta t = 0.5$ hr to estimate the total distance travelled by the professor during an hour and a half class period.

3. (3 points) Find the average value of the function shown to the right, for the domain shown. The arc in the figure is a semi-circle. Be sure it is clear how you obtain your answer.