Practice Problems — 03/04/05

(1) Find the absolute maximum and minimum values of $f(x) = \sin(x) + \cos(x)$ on the interval $[0, \pi/3]$.

(2) Find the absolute maximum and minimum values of $f(x) = x - 2\cos(x)$ on the interval $[-\pi, \pi]$.

(3) Find the absolute maximum and minimum values of $f(x) = x\sqrt{x - x^2}$ on the interval $[0, 1]$.

(4) A crazy billionaire gives you 10 meters of wire and asks you to construct a rectangle with as large an area as possible. If you are able to create a rectangle with maximum area, he will pay you $1,000,000$. What are the dimensions of this area-maximizing triangle? What is its area?