MATH 251, Calc. I, Fall 2003
Second Midterm **Name:** _____

No book, notes or calculators are allowed. Show all your work.

(20) 1. Write an equation of the tangent line to the curve $x^3 + y^3 = 7$ at the point $(2, -1)$.

(20) 2. Differentiate x^x.

(20) 3. Estimate $\sqrt[3]{65}$ by linear approximation. You do not have to simplify your answer.

(20) 4. Sketch the graph of the function $f(x) = 3x^4 - 4x^3 - 5$. List explicitly all local maxima, local minima and inflection points. Indicate clearly the concave structure and behavior at infinity. How many solutions the equation $f(x) = 0$ has?

(20) 5. Show that a rectangular solid with a square base, volume 1000, and minimal surface area is a cube.