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HOMEWORK FOR WORKSHEET 12   **MATH 1300**   **DUE April 11, 2008**

1. Consider the function $f(x) = -x^2 + 2x + 3$. Estimate the area under the graph of this function and over the x-axis through the following procedure.

(a) Provide a fairly accurate graph of the function.

(b) Subdivide the interval between the x-intercepts of the function into 4 subintervals. Over each of these subintervals draw a rectangle which lies under the curve but just touches it. Find a lower bound on the true area under the curve by summing the areas of these 4 rectangles.

(c) Repeat the instructions of part (b) except this time draw 4 rectangles which lie *over* the curve but just touch it. Sum the areas of these four rectangles to find an upper bound for the area under the curve.

2. Explain how you could find better and better lower and upper bounds for the area between the curve and the x-axis.