Instructor: Prof. A. Suciu **Name:** _____

MTH 1124 **Calculus 2** **Winter 2001**

QUIZ 7

Instructions: Put your name in the blanks above. Show your work—if there is not enough room, use another sheet. Give either **exact** answers, or numerical answers, precise to **at least** 3 decimals.

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(1) [6 points] Consider de region in the plane, R, bounded by the x-axis, the y-axis, the graph of $y = e^x$, and the line $x = 1$. For each of the following, write a definite integral, or an expression involving a definite integral, which would yield the desired quantity. **DO NOT EVALUATE THESE INTEGRALS**.

(a) The volume of the solid obtained by revolving R around the x-axis.

(b) The volume of the solid obtained by revolving R around the y-axis.

(2) [4 points] Consider the curve $y = \sqrt{x^5}$. Write a definite integral that gives the arc length of the curve between $x = 0$ and $x = 2$. **DO NOT EVALUATE THIS INTEGRAL**.

(3) [5 points] A rod of length 2 meters and density $\delta(x) = x$ kg/m is placed on the x-axis, with ends at $x = 0$ and $x = 2$. Find the coordinate of the center of mass of the rod.

(4) [5 points] A square plate with side-length 2 is placed with its center at the origin. The density is given by $\delta(y) = y + 3$ kg/m^2, where y is the distance from the x-axis. Find the total mass of the plate.