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Calculus II

Test #2

March 18, 2004

Name \_\_\_\_\_

R. Hammack

Score \_\_\_\_\_

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(1) Find the area of the region contained between the graphs of  $y = x^2 + 1$  and  $y = x$ , and between  $x = -1$  and  $x = 2$ .

(2) Find the area of the region contained between the curves  $y = \frac{x^2}{2}$  and  $y = \frac{1}{1+x^2}$ .

(3) Consider the region contained between the graphs of  $y = \sqrt{\cos(x)}$ ,  $y = 0$ ,  $x = 0$ , and  $x = \pi/3$ . This region is revolved around the  $x$ -axis. Find the volume of the resulting solid.

(4) Consider the region contained between the graphs of  $y = x^3 - 2x^2 + x$  and  $y = 0$ . This region is revolved around the  $y$ -axis. Find the volume of the resulting solid.

(5) Find the exact arc length of the curve  $y = f(x) = \int_1^x \sqrt{2t + t^2} dt$  between  $x = 1$  and  $x = 2$ .

(6) Consider the graph of  $y = \frac{x}{2} + 1$  between  $x = 1$  and  $x = 3$ . This graph is revolved around the  $x$ -axis. Find the area of the resulting surface.

(7) A variable force pushes an object 10 feet along a straight line in such a way that when the object is  $x$  feet from its starting point, the force on the object is  $2 - \frac{11}{(x+1)^2}$  pounds. How much work is done in moving the object 10 feet?