

MATH 160. TEST 4 (FALL 2004. HARVEY).

Name (2 points): \_\_\_\_\_

No notes or texts allowed. You may use a TI-83, TI-84, TI-86 or equivalent calculator. Show all work.

Problem 1-7 (10 points each). Compute the indefinite integrals.

1.

$$\int \left( \frac{1}{x} + e^x + 3 \right) dx$$

2.

$$\int (\sqrt[3]{x} + \sqrt[4]{x}) dx$$

3.

$$\int e^x(1 + e^{-x}) dx$$

4.

$$\int x^2 \sqrt{x^3 + 4} dx$$

5.

$$\int \frac{x}{x^2 + 1} dx$$

6.

$$\int x \cdot e^{2x^2+1} dx$$

7.

$$\int x^3 \sqrt{x^2 + 1} dx$$

8. Find the area below the curve  $y = 1 - x^2$  but above the  $x$ -axis.

9. Find the area between the curves  $y = x^2$  and  $y = 1 - x^2$  between  $x = 0$  and  $x = 1$ .

10. Find the area of the triangle bounded by the lines:  $y = x$ ,  $y = 3x$ , and  $y = 2 - x$ .

11. Find the average value of the function  $f(x) = x^2$  over the interval  $[1, 4]$ .

12. Suppose the Lorentz curve for income distribution for a particular community is given by the function  $y = \frac{1}{2}x^2 + \frac{1}{2}x^3$ . What is the Gini index for income disparity for this community?