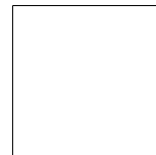


MATH 104 HOUR 4a PRINT NAME _____



April 21, 2006 SIGNATURE _____

YOU MUST SHOW ALL YOUR WORK.

(16) 1. Find the following antiderivatives:

(a) $\int \left(x^{-1/2} + \frac{2}{e^{2x}} - 5 \right) dx$

Page	Points
1-32	
2-22	
3-26	
4-20	
TOTAL	

(b) $\int \left(\frac{3x^3 + 2}{2x^4} \right) dx$

(16) 2. Evaluate the following definite integrals:

(a) $\int_{-2}^2 (3x^2 + 2x) dx$

(b) $\int_1^9 \left(x + \frac{1}{\sqrt{x}} \right) dx$

(8) 4. Find the cost function $C(x)$ if the marginal cost function is $C'(x) = \frac{3}{\sqrt{x+1}}$ dollars and $C(3) = \$20$.

(8) 5. A deposit of \$2000.00 is made in a savings account at an annual interest rate of 6% compounded continuously. Find the **average balance** in the account during the first 5 years.

(6) 6. If $\int_1^9 g(x)dx = 8$ and $\int_5^9 g(x)dx = -3$, evaluate the following definite integrals:

(a) $\int_1^9 (3x - 2g(x))dx$

(b) $\int_1^5 g(x)dx$

(14) 7. Use the **substitution method** to find the following indefinite integrals;. Clearly identify what **substitution** u you are using and show all your work.

(a) $\int \frac{x^2}{(1 + 2x^3)^{11}} dx.$

(b) $\int x\sqrt{x+2} dx$

(12) 8. Let $p = D(x) = 64 - 3x$ dollars be the **demand** function and let $p = S(x) = x^2 + 10$ dollars be the **supply** function for some commodity. The equilibrium point is then $(x_0, p_0) = (6, 46)$

(a) On the graph below, shade the region whose area is equal to the **Producer Surplus**.

(b) Find the **Producer Surplus**.

(12) 9. Let R be the region enclosed by the curves $y = 6 - x^2$, and $y = 2$.
(a) Sketch a graph of the region R including the **intersection points** of the above curves.

(b) Find $A(R)$, the area of R .

(8) 10. Sketch the region R whose area is represented by the integral

$$\int_{-1}^1 [(1 - x^2) - (x^2 - 1)] dx$$

Be sure to label the **intersection points on the graph**.