

Directions: Work all problems in the assignment. If you need more room use the back of the page to complete the problem.

Section 5.4

Problem 26. Evaluate the definite integral.

$$\int_2^2 (x - 3)^4 dx$$

Problem 38. Evaluate the definite integral.

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

Problem 78. **Marginal Analysis** Find the change in Cost, C . Revenue, R , or Profit, P . In each case, that the number of units, x , increases by three from the specified value of x .

$$\frac{dR}{dx} = 75 \left(20 + \frac{900}{x} \right), \quad x = 500$$

Problem 92. **Mortgage Debt** The rate of change of mortgage debt outstanding for one to four family homes in the United States from 1993 to 2002 can be modeled by

$$\frac{dM}{dt} = 5.4399t^2 + 6603.7e^{-t}$$

where M is the mortgage debt outstanding (in billions of dollars) and $t = 3$ corresponds to 1993. In 1993, the outstanding mortgage in the United States was \$3119 billion.

- (a) Write a model for the debt as a function of t .
- (b) What was the average mortgage debt outstanding for 1993 through 2002?

Section 5.5

Problem 24. Sketch the region between the graphs of the functions and compute the area of this region.

$$y = \frac{1}{x}, \quad y = x^3, \quad x = \frac{1}{2}, \quad x = 1$$

Problem 44. **Consumer and Producer Surplus** Find the consumer and producer surplus for the case below.

$$p_1(x) = 1000 - 0.4x^2 \quad p_2(x) = 42x$$

Problem 50. **Revenue** Two models, R_1 and R_2 , are given for the revenue (in billions of dollars per year) for a large corporation. Both models are estimates of revenues for 2004-2008, with $t = 4$ corresponding to the year 2004. Which model is projecting the greatest revenue? How much more revenue does that model project for the four year period?

$$R_1(x) = 7.21 + 0.26t + 0.02t^2, \quad R_2(x) = 7.21 + 0.1t + 0.01t^2$$

Student ID: _____

Dept. & Number: Math 1100

Lesson Number: 11

Name: _____

Address: _____
Street Apt.

_____ City State Zip Code

Date: _____

Grade: _____

Read By: _____

Comments: _____
