Math 2123 - Math Center Worksheet
Section 5.1

1. A water tank drains at a rate of $r(t) = -2t$ gallons per minute, t minutes after the plug is pulled.
a. Sketch a graph of r(t) over the interval from t=0 to t=6. Label the axes.

b. The units on the width of the region between r(t) and the t-axis are

c. The units on the height of the region between r(t) and the t-axis are

d. The exact area of the region between r(t) and the t-axis from t=0 to t=6 is

e. Interpret the area in context.

2. The rate of change in car sales (in hundred cars per month) is modeled by C(t), where t is the number of months after December 2001.
a. What does the area of the region between the graph of C lying above the t-axis and the t-axis represent?

b. What are the units on
i. the width of this region?
ii. the height of this region?
iii. the area of this region?

Math 2123 - Math Center Worksheet
Section 5.2

1. A small college is looking at data on the sale of tickets to their home football game. The following data show the rate of change in the sale of tickets for a given price.

Ticket price (dollars)	10	15	20	25	30	35	40
ROC of Sales (tickets per dollar	183	138	103	79	58	45	33

a. Write a complete exponential model for the data.

b. Use 3 right rectangles to estimate the change in sales when the ticket price increases from \$10 to \$40.

c. Use 5 midpoint rectangles to approximate the area between the graph of the model you generated in part a and the price axis on the interval [15, 30].

d. Write an interpretation of your answer to part c.

2. Suppose that the rate of flow of revenue for a company can be modeled by $r(x) = 2.58x^3 - 10.44x^2 - 5.62x - 15.95$ million dollars per year where x is the number of years after 1990.

a. Use the idea of a limit of sums to calculate $\int_2^4 r(x)\,dx$. Continue doubling N, the number of rectangles, in the following table until the approximation is accurate to the nearest tenth.

N	Midpoint Approximation
10	

$$\int_2^4 r(x)\,dx \cong \underline{\hspace{4cm}}.$$

b. Write an interpretation of your answer to part a.

Math 2123 - Math Center Worksheet
Section 5.4

1. Evaluate the following indefinite integrals:

a. $\int \frac{1}{9t^3}\ dt$

b. $\int e^2\ dy$

c. $\int 5\sqrt{x}\ dx$

2. The rate of change of the number of Campbell Soup employees from 1990 through 1998 can be described by $s(t) = -0.689t^2 + 4.665t - 7.107$ thousand employees per year, t years after 1990. In 1993, there were 23,800 people employed by Campbell Soup. Recover the model for the number of Campbell Soup employees.