



Homework 8.7 – Modeling Accumulated Change with the TI-84

1. (1 pt) [alfredLibrary/AUCI/chapter8/lesson7/calc1pet.pg](#)

A particle that moves along a straight line has velocity

$$v(t) = 250t^2 e^{-4t}$$

meters per second after t seconds. How many meters will it travel during the first 8 seconds?

Answer: _____ meters

2. (1 pt) [alfredLibrary/AUCI/chapter8/lesson7/calc3pet.pg](#)

Use your calculator to compute the integral.

$$\int_{-1}^5 |10x^2 - x^3 - 16x| dx = \underline{\hspace{2cm}}$$

3. (1 pt) [alfredLibrary/AUCI/chapter8/lesson7/calc2pet.pg](#)

Suppose that the density of cars (in cars per mile) along the northernmost 20-mile stretch of the Garden State Parkway is approximated by $\delta(x) = 125(2 + \sin(4\sqrt{x} + 0.175))$, where x is the number of miles from the New York border. Find the total number of cars on the 20-mile stretch.

Answer: _____ cars

4. (1 pt) [alfredLibrary/AUCI/chapter8/lesson7/calculator1pet.pg](#)

View a scatter plot of the following data set and observe that it exhibits cubic behavior:

t	$y = a_3t^3 + a_2t^2 + a_1t + a_0$
0	5.853
0.5	9.87456
1	11.4935
1.5	11.2644
2	10.1606
2.5	8.6938
3	7.60536
3.5	7.74682
4	9.84068

(NOTE: Round all numbers in your answers to four decimal places.)

(a) Find a cubic regression model for the data:

(b) Find the critical points of the model: _____

(c) The local maximum of the model on the interval $[0, 4]$ is

(d) The local minimum for of the model on the interval $[0, 4]$ is

(e) Find the net change in the data on the interval $[0, 4]$ by integrating the regression model: _____