1. You are driving when all of a sudden, you see traffic stopped in front of you. You slam the brakes to come to a stop. While your brakes are applied, the velocity of the car is measured, and you obtain the following measurements:

Time since applying breaks (sec)	0	1	2	3	4	5
Velocity of car (in ft/sec)		88	60	40	25	10	0

Using the points given, determine upper and lower bounds for the total distance traveled before the car came to a stop.

2. Consider the function $f(x) = x + 2x^2$ on the interval $[0, 2]$. Using a midpoint estimate with $n = 4$ subintervals, estimate the *average value* of f.

3. A marketing company is trying a new campaign. The campaign lasts for three weeks, and during this time, the company finds that it gains customers as a function of time according to the formula:

$$C(t) = 5t - t^2,$$

where t is time in weeks and the number of customers is given in thousands.
Using the general form of the definite integral,

$$\int_a^b f(x)dx = \lim_{n \to \infty} \frac{b-a}{n} \sum_{i=1}^n f(x_i^*),$$

calculate the **average** number of customers gained during the three-week campaign.