Written Homework 2

MATH 126

Solve each of the following problems. Work out your problems on scratch paper first, then write your solutions neatly on the pages you plan to turn in. Write the problems in assigned order, with each problem clearly labeled. Use words to clearly explain your work and methods. The reader should never have to guess or infer your intentions.

For a brief guide to writing homework solutions, see Writing Mathematics Well from Harvey Mudd College.

Scan or photograph your solutions and submit them (as a single file) to the Written Homework 2 assignment on Moodle. This assignment is due at classtime on **Monday, September 15**.

1. (a) Draw a graph of the function $f(x) = 2 + x$. On your graph, shade the region whose area is $\int_0^3 (2 + x)\ dx$.

(b) Use a left Riemann sum with $n = 3$ rectangles to estimate $\int_0^3 (2 + x)\ dx$.

(c) Use a midpoint Riemann sum with $n = 3$ rectangles to estimate $\int_0^3 (2 + x)\ dx$.

(d) Use geometry to find the exact answer for $\int_0^3 (2 + x)\ dx$.

(e) Use the Fundamental Theorem of Calculus to evaluate $\int_0^3 (2 + x)\ dx$. (Hint: you will need an antiderivative for this.) Confirm that your answer matches what you found in part (d).

2. A truck driver applies the brakes, and the truck stops six seconds later. While the brakes are on, the following velocities are recorded:

Time since brakes applied (sec)	0	2	4	6
Velocity (ft/sec)	90	58	32	0

(a) Give lower and upper estimates for the distance the truck traveled after the brakes were applied. Explain your reasoning.

(b) Make a sketch the truck's velocity against time. Show your upper and lower estimates on your sketch.

(c) What definite integral have you approximated in this problem?