Written Homework 3

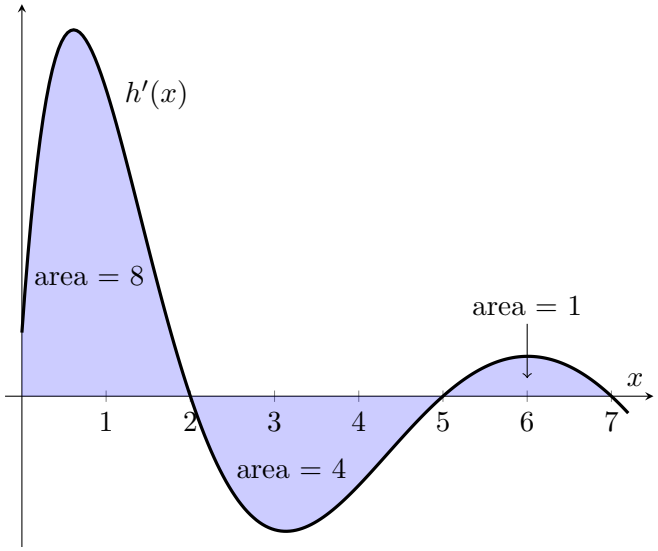
MATH 126

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 3 assignment on Moodle. This assignment is due at classtime on **Friday, September 19**.

1. The following figure shows the graph of the derivative $h'(x)$ of a function $h(x)$. Suppose that $h(0) = 2$. Sketch the graph of $h(x)$ on the interval $0 \le x \le 7$. On your graph, indicate all critical points of h (that is, points where $h'(x) = 0$) and state their coordinates. Explain in words how you know that your critical points are correct.



2. Calculate each of the following. Make sure you display all of your supporting work. If you make a substitution, show all steps that lead to a successful substitution.

(a) $\displaystyle\int \cos(2+5x)\,dx$

(b) $\displaystyle\int_0^3 \frac{dx}{4x+1}$

(c) $\displaystyle\int \frac{\sin(\sqrt{x})}{\sqrt{x}}$

3. Suppose $f(x)$ is a continuous function such that $\displaystyle\int_0^9 f(x) = 8$.

Calculate $\displaystyle\int_0^3 x\, f(x^2)\,dx$.