For the upcoming midterm, you'll need:

1) a blue book;
2) a stapler;
3) remember your TA's name and section time;
4) a picture ID.

The following instruction will be on the real midterm:

Books, notes are NOT allowed. No calculators are allowed. READ the problems carefully. Put final answers in the boxes on this page. Put high quality work in the blue book for all answers. At the end of exam STAPLE this page to the INSIDE front blue cover of the blue book, so that this side faces the white writing pages of the blue book; staple only once at the upper left corner (one bonus point for doing this the correct way).

The following will appear before the instruction on the real midterm:

Print Your Perm Number _____ Name _____

Circle your TA's name and Discussion time:

Ryan Blair R 8am ; 5pm; 6pm; 7pm

Robert Sulway T 8am; 5pm; 6pm; 7pm;

3B Practice Midterm #1 W 2010
Jan 2010 Instructor: Prof. Dai

1. Let $s(t)$ denote the position of a particle at time t, and let $v(t)$ and $a(t)$ be the velocity and acceleration respectively. The particle is moving according to the data $a(t) = 10\sin(t) + 3\cos(t); s(0) = -5; s(2\pi) = -1$. Find $s(t)$

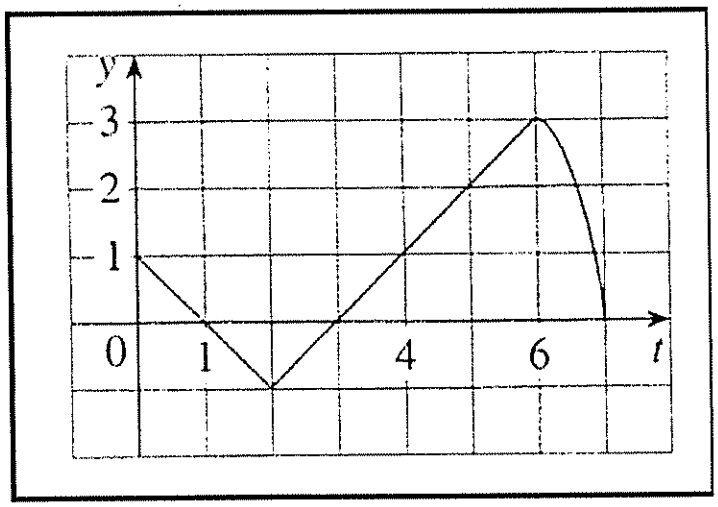
2. Consider the function $f(x) = \frac{\ln(x)}{x}; 2 \leq x \leq 10$

(a) Find L_4 and R_4. Do not simplify your answer.
(b) Write down the Riemann sum expression that represents the area under the graph of f as a limit.

3. Let $g(x) = \int_0^x f(t)dt$; where f is the function whose graph is shown below.

(a) Find $g(0), g(2), g(6)$
(b) Find all the critical points of $g(x)$ and determine if they are local maximum or minimum.

Graph of f:



4 Let $y = \int_1^{x^2} \frac{\cos(5t)}{t} dt$. Use the Fundamental Theorem of Calculus to find y'.

5. Find the following integrals.

(a) $\int \frac{(\ln x)^3}{x} dx$.

(b) $\int_0^1 \frac{4x}{3x^2+4} dx$

6 Find the area of the region bounded by

$$x = y^3 - 2, \quad y = x + 2$$

7. Find the volume of the solid obtained by rotating the region bounded by $y = x^3, y = x, x \geq 0$ about the x-axis. Sketch the region, the solid, and a typical disk or washer