Math 125I **First Midterm** **Winter 2003**

Your Name

Your Signature

Student ID #

	Patrick	Aggeliki	
Section (Tues.)	1:30	1:30	2:30
(circle one)	IA	IB	IC

Problem	Total Points	Score
1	12	
2	10	
3	6	
4	10	
5	12	
Total	50	

- This exam is closed book. You may use one $8\frac{1}{2} \times 11$ sheet of notes.
- Do not share notes.
- Graphing calculators are not allowed.
- In order to receive credit, you must show your work. Do not do computations in your head. Instead, write them out on the exam paper.
- **Place a box around YOUR FINAL ANSWER to each question.**
- If you use a trial and error (or guess and check) method when an algebraic method is available, you will not receive full credit.
- If you need more room, use the backs of the pages and indicate to the reader that you have done so.
- Raise your hand if you have a question.

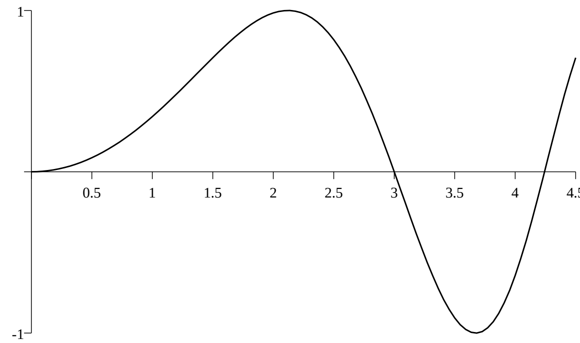
1 (12 points) Compute the following integrals. Give your answers in exact form.

(a) (4 points) $\displaystyle\int_1^8 \frac{2x+5}{\sqrt[3]{x^2}}\,dx$

(b) (4 points) $\displaystyle\int_0^\pi \frac{\sin t}{1+\cos^2 t}\,dt$

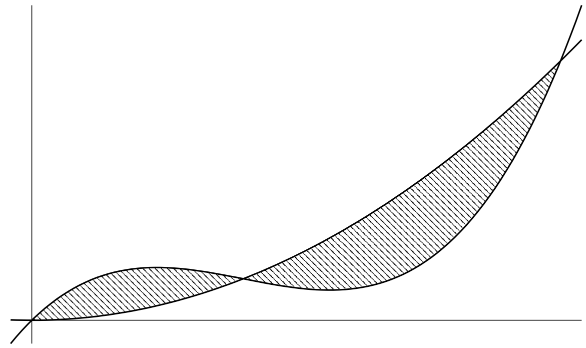
(c) (4 points) $\displaystyle\int y^3\sqrt{y^2-7}\,dy$

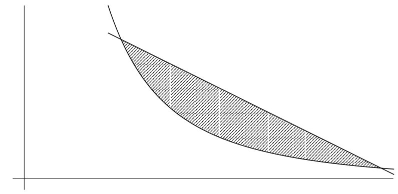
2 (10 points) A model car travels along a straight track. Its velocity is given by the function $v(t) = \sin\left(\frac{\pi t^2}{9}\right)$, where t is in seconds and v is in feet per second. Use the Midpoint Rule and $n = 6$ to estimate the **total** distance traveled by the car between $t = 1$ and $t = 4$ seconds.



3 (6 points) Let $f(x) = \int_0^{x^2-4x} e^{\sqrt{t}}\, dt$. Find the interval on which $y = f(x)$ is increasing.

4 (10 points) Compute the total area bounded by the curves $y = x^2$ and $y = x^3 - 6x^2 + 10x$.





5 (12 points) Let R be the region in the first quadrant bounded by $y = \dfrac{9}{x^2}$ and $y = 13 - 4x$. Set up the following integrals.

DO NOT EVALUATE.

(a) (6 points) Set up an integral that computes the volume of the solid generated by rotating R around the x-axis using the method of washers.

(b) (6 points) Set up an integral that computes the volume of the solid generated by rotating R around the line $x = -2$ using the method of shells.