MATH 161 EXAM 4, FALL 2003

In problems 1-5, find the given integrals	Name:	Score	
1.	a) $\int_1^2 6t^2\,dt$	b) $\int \sqrt[3]{r}\,dr$	1	
			2	
			3	
			4	
			5	
			6	
			7	
	Ans:_____.	Ans:_____.	8	
2.	a) $\int \sqrt{x}(4+x)\,dx$	b) $\int \sec^2(3t)\,dt$	9	
			10	
			Tot	
	Ans:_____.	Ans:_____.		
3.	a) $\int_0^{1/4} \sin(2\pi y)\,dy$	b) $\int_0^1 ze^{-z^2}\,dz$		
	Ans:_____.	Ans:_____.		
4.	a) $\int_1^e \frac{\ln x}{x}\,dx$	b) $\int \frac{4}{1+5x}\,dx$		
	Ans:_____.	Ans:_____.		
5.	a) $\int \frac{\cos x}{1+\sin^2 x}\,dx$	b) $\int x\tan x^2 \sec x^2\,dx$		
	Ans:_____.	Ans:_____.		
	Extra Space			

		Name:
6.	Use the Fundamental Theorem of Calculus to find:	
	a) $\dfrac{d}{dx}\displaystyle\int_2^x \sin(t^3+9)\,dt$ Ans:_____.	b) $\dfrac{d}{dx}\displaystyle\int_1^{x^2} \sqrt{t^4+16}\,dt$ Ans:_____.
7.	Find the area bounded by $x = 4 - y^2$ and $x = y^2 - 4$.	
	a) Set up the integral Ans:_____.	b) Compute the integral Ans:_____.
8.	The region bounded by $x = y^2$ and $x = 1$ is rotated about $x = 1$. Find the volume generated.	
	a) Set up the integral Ans:_____.	b) Compute the integral Ans:_____.
9.	The region bounded by $y = x - x^2$ and $y = 0$ is rotated about the y-axis. Find the volume generated.	
	a) Set up the integral Ans:_____.	b) Compute the integral Ans:_____.
10	A force of 12 N is required to stretch a spring by 40 cm beyond its natural length.	
	a) Find the spring constant. Ans:_____.	b) How much work is it required to stretch the spring an additional 20 cm Ans:_____.