Name: _____

TA's Name:

Instructions: You must show supporting work to receive full and partial credits. No text book, notes, formula sheets allowed.

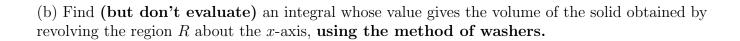
1. (27 points, 9 points each) Evaluate each of the following integrals (No calculators allowed on this problem).

(a)
$$\int \frac{x^2}{\sqrt{x+3}} dx$$

(b)
$$\int_0^2 x^2 e^{x^3} dx$$

(c)
$$\int \frac{1}{x(\ln x)^2} \, dx$$

2.	(24 points, 8 points each) Let R be the region enclosed by $y = x^2$, $y = 2x$.
	(a) Find (but don't evaluate) an integral whose value gives the exact area of the region R .



(c) Find (but don't evaluate) an integral whose value gives the volume of the solid obtained by revolving the region R about the vertical line x = -1, using the method of cylindrical shells.

3.	(14 points, 7 points each) The Great Pyramid at Gizeh is 500 feet high rising from a square base of side 750 feet. Assume that the stone making up the pyramid weighs 200 ponds per cubic foot.						
	(a) Find a Riemann sum whose value approximates the total amount of work done in building the pyramid.						
	(b) Write down but do not evaluate an integral whose value is exactly the total amount of work done in building the pyramid.						
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4.	(10 points) An underwater viewing window is a disc of radius 6 inches, with its top 8 feet below the surface of an aquarium. Write down but do not evaluate an integral whose value is the total hydrostatic force that the viewing window has to sustain.						
	(Continue on Next Page						

5. (25 points, 5 points each) The following table gives some values of a function y = f(x) on the interval [0, 1.2]:

37	Ω	0.2	0.4	0.6	0.8	1.0	1.9
f(x)	0	0.2	0.4	1.0	1.6	2.0	2.2

Approximate the value of the integral $\int_0^{1.2} f(x)dx$ by the following Riemann sums:

- (a) The left point sum L_3
- (b) The right point sum R_3
- (c) The midpoint sum M_3
- (d) The trapezoid sum T_3
- (e) The Simpson sum S_3