# Math 152

**Show Your Work!** February 9, 2009 Name _____
Good Luck! Quiz #4 A (please print)

1. (a) Represent the length L of the curve $f(x) = (x-1)^2$ for $0 \le x \le 3$ as a definite integral. (Do not evaluate.)

$L = \int$

(b) Represent the length L of the curve $x(t) = \sin(t)$, $y(t) = 1 + t^2$ for $0 \le t \le 3$ as a definite integral. (Do not evaluate it.)

$L = \int$

(2) (2)

2. Represent as a definite integral the volume if the shaded region in Fig. 1 (between $y = x^2$ *and* $y = 2x$, $0 \le x \le 2$) is rotated around the x-axis.

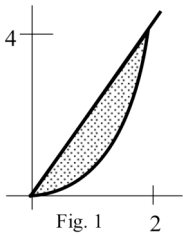


Fig. 1

Volume = $\int$ (Do not evaluate it.)

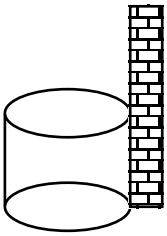
(3)

3. A spring is 8 inches long when no weight is attached and 11 inches long when a 6 pound weight is attached. How much work is done to stretch the spring from a length of 10 inches to a length of 18 inches? Write a definite integral for this work and then use the FTC (antider.) to evaluate the integral:

Work = $\int$ = _____ (number) with 2 decimal places & units)

(3) (1)

4. A cylindrical tank that has radius 2 feet and height 4 feet is filled with a liquid that has density 52 pounds per cubic foot. How much work is done to pump the top one foot of liquid over the top of a 7 foot tall wall?. (Do not evaluate.)



Work = $\int$

(3)

5. As I pull a box along the ground, I need to apply different amounts of force at different locations in order to overcome friction. At location x feet I need to pull with a force of $\frac{2x}{1+x^2}$ pounds. How much work do I do to pull the box from x=0 to x=4? (Do not evaluate.)

Work = $\int$

(2)

6. Quickies: $\int \cos(5x)\ dx =$_____ $\int \tan(x)\ dx =$ _____ $\int \frac{5}{x^2}\ dx =$ _____

(3)

7. (a) What did Paul Erdos do with the money he got as awards? _____
(2) (b) What was Jean Taylor's original college major or what object did she study? _____