

Math 125

October 13, 2008

TEST #1 A

Name _____

(please print)

Show Your Work!

Good Luck!

What calculator are you using? _____ (1)

1. Carefully and completely state **Part I** of the Fundamental Theorem of Calculus.

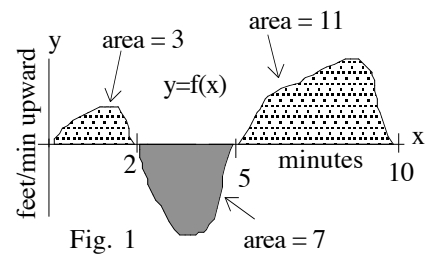
(5) If

then

2. Use the graph in Fig. 1 to evaluate the following integrals. (2 points each)

(16) $\int_2^{10} f(x) dx = \underline{\hspace{2cm}}$ $\int_0^{10} |f(x)| dx = \underline{\hspace{2cm}}$

$\int_0^5 2 + f(x) dx = \underline{\hspace{2cm}}$ $\int_2^5 3f(x) dx = \underline{\hspace{2cm}}$



$\int_0^{10} 4x - f(x) dx = \underline{\hspace{2cm}}$ $\int_5^0 f(x) dx = \underline{\hspace{2cm}}$

If x is time (minutes) and y=f(x) is your upward velocity (feet/minute), then at t=4, you are moving

UP DOWN NEITHER (circle one)

After 10 minutes, how far are you from your starting point? _____

3. The table shows the velocity of a truck as it comes to a stop.

t (sec)	0	1	2	3	4	5	6
vel (ft/sec)	70	55	50	40	25	10	0

(a) Use N = 3 and MIDPOINTS

to approximate the distance the truck traveled as it came to the stop. (Show your work.)

(4) Approximate stopping distance = _____

(2) (b) Was the truck decelerating more during the first second or during the last second? FIRST LAST SAME

4. (a) $\frac{d}{dx} \left(\int \sin(x^3) dx \right) = \underline{\hspace{2cm}}$

(8) (b) $\frac{d}{dx} \left(\int_1^5 \sin(x^3) dx \right) = \underline{\hspace{2cm}}$

(c) $\int \left(\frac{d}{dx} (\sin(x^3)) \right) dx = \underline{\hspace{2cm}}$

(d) $\frac{d}{dx} \left(\int_1^{x^2} \sqrt{2+t^3} dt \right) = \underline{\hspace{2cm}}$

5. On the interval $0 \leq x \leq 4$, $\lim_{n \rightarrow \infty} \left\{ \sum_{i=1}^n 6\sqrt{x_i} \Delta x_i \right\} = \int \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$
(fill in integral) (exact number)

(3)(3)

6. Do the following integrals. Give numerical answers to 2 decimal places. Show your work.
(No work = no points)

(a) $\int x \cdot \sin(x^2 + 3) dx = \underline{\hspace{2cm}}$

(5)

(b) $\int_0^2 \frac{6x^2}{x^3 + 5} dx = \underline{\hspace{2cm}}$

(6)

$$(c) \int \frac{10x^2 + 5x + 3}{2x} dx = \underline{\hspace{2cm}}$$

(5)

$$(d) \int_{1.6}^{3.3} INT(x) dx = \underline{\hspace{2cm}}$$

(6)

$$(e) \int \sin^2(x) dx = \underline{\hspace{2cm}}$$

(5)

$$(f) \int_0^2 \frac{x^2 + 5x + 10}{x + 3} dx = \underline{\hspace{2cm}}$$

(6)

7. If you are driving at 36 feet per second and apply the brakes at time $t=0$, then your velocity will be

$$v(t) = x^2 - 12x + 36 \text{ feet per second until you come to a stop at } t=6 \text{ seconds.}$$

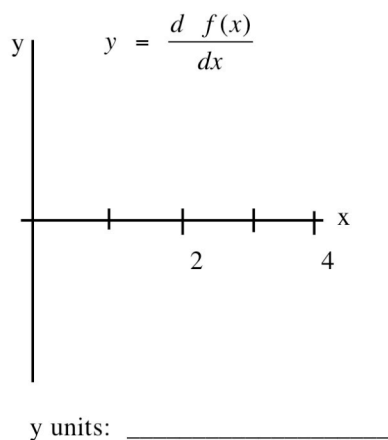
(5) (a) How far did the car travel during those 6 seconds? $\underline{\hspace{2cm}}$

(2) (b) What was your acceleration at $t = 2$ seconds? $\underline{\hspace{2cm}}$

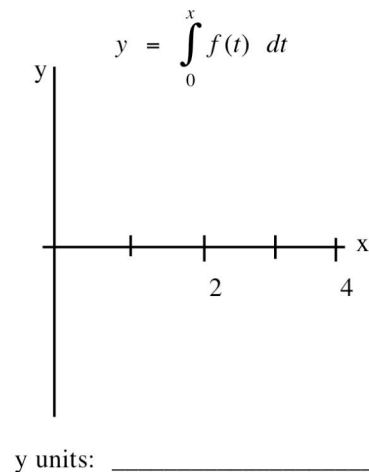
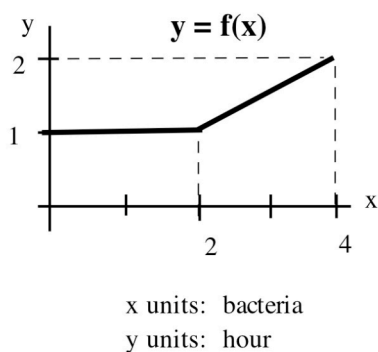
8. The middle graph below shows $y = f(x)$ where x is bacteria and y is hours.

Draw the left graph $y = \frac{d f(x)}{d x}$ and draw the right graph $y = \int_0^x f(t) dt$.

Put a scale (1, 2, 3, ...) on each y-axis, and give the units for each y variable.



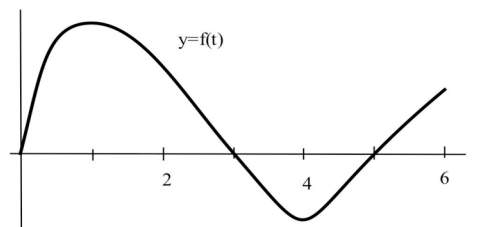
(4)



(7)

9. $B(t) = \int_0^t f(t) dt$ (see the graph of $y=f(t)$)

- (a) $B(x)$ is LARGEST when $x = 0$ 1 2 3 4 5 6
- (b) $B'(x)$ is LARGEST when $x = 0$ 1 2 3 4 5 6
- (c) Which is LARGER? $B(3)$ $B(5)$ same
- (d) $B'(2)$ is (positive) (negative) (zero) (not enough information)



10. Biographies

- (2) (a) Name the two people credited with inventing calculus: _____ and _____
- (1) (b) What is Jean Taylor's hobby? _____

THE END !!