College of the Holy Cross, Fall 2007
Math 132, Midterm Exam 1 (All Sections)
Wednesday, February 20, 6 PM

Your Name: _____

Your Section:

Little (8:00am) ____ Ballantine (9:00am) ____
DeStefano (10:00am) ____ DeStefano (noon) ____

Instructions: For full credit, you must show *all work* on the test pages and place your final answer in the box provided for the problem. Use the back of the preceding page if you need more space for scratch work. The numbers next to each part of the questions are their point values.

Please do not write in the space below

Problem	Points/Poss
I	/ 10
II	/ 10
III	/ 15
IV	/ 35
V	/ 30
Total	/100

I. (10) State the definition of the definite integral $\int_a^b f(x)\ dx$.

II. Compute the derivatives of each of the following functions defined by integrals.

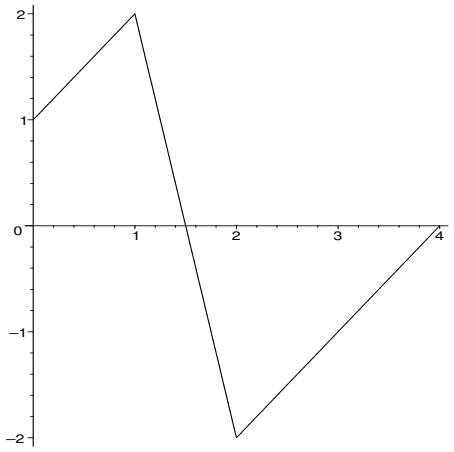
A. (5) $f(x) = \int_1^x e^{t^2}\ dt$

$f'(x) =$ [ ]

B. (5) $g(x) = \int_{x^2}^4 \frac{\cos(t)}{t^2}\ dt$

$g'(x) =$ [ ]

III. The following graph (made up of straight line segments) shows $y = f(t)$ for $0 \leq t \leq 4$.



Given: $f(1) = 2$, $f(2) = -2$, $f(3) = -1$, and $f(4) = 0$, The function F is defined by $F(x) = \int_0^x f(t)\, dt$.

A. (5) Determine the values $F(x)$ for $x = 0, 1, 2, 3, 4$ and enter them in the following table.

x	0	1	2	3	4
$F(x)$					

B. (5) Does $F(x)$ have any critical points? If so, say where. If not say why not.

Critical point(s) of $F(x)$ | |

C. (5) Over which interval(s) is $F(x)$ concave down?

Concave down on: | |

IV.

A. (5) Integrate with a suitable u-substitution: $\int_0^1 (4x^3+1)^{3/5} x^2 \, dx$.

Answer:

B. (5) Integrate with a suitable u-substitution: $\int \frac{x \sin(3x^2)}{\cos(3x^2)+1} \, dx$.

Answer:

C. (7.5) Integrate by parts: $\int x^2 \sin(5x)\ dx$

Answer:

D. (7.5) Integrate with the partial fraction method: $\int \frac{3x^2+1}{x^2+5x+6}\,dx$

Answer:

E. (10) Integrate via trigonometric substitution: $\int \sqrt{36 - x^2}\, dx$

Answer:

V. Integrate using any applicable method or the table. If you do use the table, give the number of the entry you are using.

A. (10) $\int \tan x \sec^4 x \; dx.$

Answer:

B. (10) $\int \frac{\sqrt{9+e^{2x}}}{e^x} \; dx$

Answer:

C. (10) $\int \frac{dx}{x^2+8x+17}$.

Answer: