Math 1B (7:30am – 8:20am)
Quiz 8 Version B
Fri Jun 11, 2010

SCORE: ___ / 30 POINTS

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your social security number ? ___ ___
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

NO CALCULATORS ALLOWED

YOU MUST SHOW PROPER CALCULUS LEVEL WORK
(INCLUDING SANITY CHECKS WHERE RELEVANT) TO EARN FULL CREDIT

Evaluate $\int_2^\infty xe^{-\frac{x}{2}}dx$.

SCORE: ___ / ___ POINTS

SEE 7:30 VERSION A
QUESTION 4

Find $\int \tan^{-1}\sqrt{x}\,dx$.

SCORE: ___ / ___ POINTS

SEE 7:30 VERSION A
QUESTION 3

Evaluate $\int_0^3 (x-1)^{-3}\,dx$.

SCORE: ___ / ___ POINTS

$$= \int_0^1 (x-1)^{-3}\,dx + \int_1^3 (x-1)^{-3}\,dx$$

$$\hookrightarrow = \lim_{N\to 1^-} \int_0^N (x-1)^{-3}\,dx$$

$$= \lim_{N\to 1^-} -\tfrac{1}{2}(x-1)^{-2}\Big|_0^N$$

$$= \lim_{N\to 1^-} -\tfrac{1}{2}\left((N-1)^{-2}-1\right)$$

$$= -\infty$$

DIVERGES

$$\int (x-1)^{-3}\,dx$$

$u = x-1$

$du = dx$

$$= \int u^{-3}\,du$$

$$= -\tfrac{1}{2}u^{-2}$$

$$= -\tfrac{1}{2}(x-1)^{-2}$$

Find $\int \frac{e^{2x}}{1+e^x}\,dx$.

SCORE: ___ / ___ POINTS

$u = e^x$

$du = e^x\,dx$

$\frac{1}{e^x}\,du = dx$

$$\frac{e^{2x}e^x}{1+e^x}\frac{1}{e^x}\,du = \frac{e^x}{1+e^x}\,du = \frac{u}{1+u}\,du$$

$$\int \frac{u}{1+u}\,du = \int \left(1 - \frac{1}{1+u}\right)du$$

$$= u - \ln|1+u| + C$$

$$= e^x - \ln|1+e^x| + C$$

$$= e^x - \ln(1+e^x) + C$$

SEE 7:30 VERSION A QUESTION 1 FOR ALTERNATE SOLUTION

HAND IN THIS SECTION TO RECEIVE THE TABLE OF INTEGRALS

Math 1B (7:30am – 8:20am)
Quiz 8 Version B
Fri Jun 11, 2010

SCORE: ___ / 30 POINTS

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your social security number ? ___ ___
[IF YOU DO NOT HAVE A SOCIAL SECURITY NUMBER, USE YOUR STUDENT ID NUMBER]

NO CALCULATORS ALLOWED

YOU MUST SHOW PROPER CALCULUS LEVEL WORK
(INCLUDING SANITY CHECKS WHERE RELEVANT) TO EARN FULL CREDIT

Evaluate $\int \frac{1}{x^5\sqrt{x^8-9}}\,dx$ using the table of integrals.

SCORE: ___ / ___ POINTS

STATE THE NUMBER OF THE RULE YOU ARE USING.

$u = x^4$

$du = 4x^3\,dx$

$\frac{1}{4x^3}\,du = dx$

$\frac{1}{x^5\sqrt{x^8-9}}\,\frac{1}{4x^3}\,du = \frac{1}{4x^8\sqrt{x^8-9}}\,du = \frac{1}{4}\,\frac{1}{u^2\sqrt{u^2-9}}\,du$

$\frac{1}{4}\int \frac{1}{u^2\sqrt{u^2-9}}\,du = \frac{1}{4}\,\frac{\sqrt{u^2-9}}{9u} + C = \frac{\sqrt{x^8-9}}{36x^4} + C$

RULE (45) $a=3$

USE THE SPACE BELOW AND ON THE OTHER SIDE FOR SCRATCH WORK