MATH 1206 COMMON EXAM SPRING 2007

FORM A

INSTRUCTIONS Please enter your NAME, ID NUMBER, FORM designation letter, and CRN on your op scan sheet. The CRN should be written in the upper right-hand box labeled "Course." Do not include the course number. In the box labeled "Form," write the appropriate form letter as shown above. Darken the appropriate circles below your ID number and Form designation. **Use a #2 pencil.**

Mark your answers to the test questions in rows 1-15 of the op scan sheet. You have one hour to complete this part of the final exam. Your score on this part will be the number of correct answers. Turn in the op scan sheet with your answers and the question sheets, including this cover page, at the end of this part of the final exam.

Exam policies: You may **not** use a book, notes, formula sheet, calculator, or computer. Giving or receiving unauthorized aid is an Honor Code Violation.

Signature _____

Name (printed) _____

Student ID # _____

1. $\int \sin^3 2x\,dx$ equals:

(1) $\frac{1}{6}\cos^3 2x - \frac{1}{2}\cos 2x + C$ (2) $-\frac{1}{6}\cos^3 2x + \frac{1}{2}\cos 2x + C$

(3) $-\frac{1}{3}\cos^3 2x + \cos 2x + C$ (4) $\frac{1}{8}\sin^4 2x + C$

2. If $f(x) = \int_{x^2}^{2} \sqrt{t+1}\,dt$, find the value of $f'(4)$.

(1) $\sqrt{5}$ (2) $\sqrt{17}$ (3) $-8\sqrt{5}$ (4) $-8\sqrt{17}$

3. Evaluate $\int \frac{\sec(\ln x)\tan(\ln x)}{x}\,dx$.

(1) $\sec(\ln x)+C$ (2) $\csc(\ln x)+C$ (3) $\tan(\ln x)+C$ (4) $\tan\left(\frac{1}{x}\right)+C$

4. $\int_0^2 \frac{x^4+2x^3+1}{x^4+1}\,dx$ equals:

(1) $\frac{16}{17}$ (2) $\frac{33}{17}$ (3) $2+\frac{1}{4}\ln 17$ (4) $2+\frac{1}{2}\ln 17$

5. Find the value of the integral $\int_{-3}^{4} |x-2|\,dx$.

(1) -10.5 (2) 10.5 (3) 12.5 (4) 14.5

6. Set up an integral to find the volume of the solid generated by rotating the region bounded by $x=8-y^2$ and $x=y+6$ about the line $x=-3$.

(1) $\int_{-2}^{1} p\,[(8-y^2)^2-(y+6)^2]\,dy$ (2) $\int_{-2}^{1} p\,[(3+(8-y^2))^2-(3+(y+6))^2]\,dy$

(3) $\int_{-2}^{1} p\,[(3-(8-y^2))^2-(3-(y+6))^2]\,dy$ (4) $\int_{-2}^{1} 2p\,(y+3)[(8-y^2)-(y+6)]\,dy$

7. Find the moment with respect to the y-axis, M_y, for the region of density $d=1$ bounded by $x=8-y^2$ and $x=y+6$.

(1) $\int_{-2}^{1} [(8-y^2)^2-(y+6)^2]\,dy$ (2) $\int_{-2}^{1} \frac{1}{2}[(8-y^2)^2-(y+6)^2]\,dy$

(3) $\int_{-2}^{1} y[(8-y^2)-(y+6)]\,dy$ (4) $\dfrac{\int_{-2}^{1} y[(8-y^2)-(y+6)]\,dy}{\int_{-2}^{1} [(8-y^2)-(y+6)]\,dy}$

8. Set up an integral to find the volume of the solid generated by rotating the region bounded by $x = 8 - y^2$ and $x = y + 6$ about the line $y = 7$.

(1) $\int_{-2}^{1} p\,[(8-y^2)^2 - (y+6)^2]\,dy$

(2) $\int_{-2}^{1} 2p\,(y)[(8-y^2) - (y+6)]\,dy$

(3) $\int_{-2}^{1} p\,[(7-(8-y^2))^2 - (7-(y+6))^2]\,dy$

(4) $\int_{-2}^{1} 2p(7-y)[(8-y^2) - (y+6)]\,dy$

9. Evaluate the integral $\int_0^1 \frac{1}{x^2+3x+2}\,dx$.

(1) $\ln\frac{3}{2}$

(2) $\ln\frac{2}{3}$

(3) $\ln\frac{4}{3}$

(4) $\ln\frac{3}{4}$

10. Evaluate the integral $\int \tan^{-1}(3x)\,dx$.

(1) $\frac{3}{1+9x^2} + C$

(2) $x\tan^{-1}(3x) - \frac{1}{6}\ln(1+9x^2) + C$

(3) $x\tan^{-1}(3x) + \frac{1}{6}\ln(1+9x^2) + C$

(4) $\frac{1}{3}x\tan 3x - \frac{1}{18}\ln(1+9x^2) + C$

11. $\int_{-2}^{2} \left(x^2+3\right)^2\,dx$ equals:

(1) 0

(2) $\frac{202}{5}$

(3) $\frac{244}{5}$

(4) $\frac{404}{5}$

12. Evaluate: $\lim_{x\to 0} \dfrac{\cos 3x - \cos 2x}{x^2}$.

(1) $-\dfrac{5}{2}$ (2) $-\dfrac{1}{2}$ (3) 0 (4) $-\infty$

13. Decide whether the following integral converges or diverges. If it converges, find the value. $\int_0^{\infty} \dfrac{x}{(x^2+2)^2}\,dx$.

(1) $\dfrac{1}{4}$ (2) $-\dfrac{1}{2}$ (3) $\dfrac{1}{2}$ (4) diverges

14. Evaluate: $\int \dfrac{x^2}{\sqrt{4-x^2}}dx$.

(1) $\dfrac{4}{3}\sin^3 x + C$ (2) $2\arcsin\dfrac{x}{2} - x + C$

(3) $2\arcsin\dfrac{x}{2} - \dfrac{x\sqrt{4-x^2}}{2} + C$ (4) $2\arcsin\dfrac{x}{2} - \sqrt{4-x^2} + C$

15. Suppose an individual calculated the velocity v of a vehicle at time t and found the following:

t (seconds)	4	8	12	16	20
v (feet/second)	2	12	30	50	80

Use Simpson's rule to estimate the distance traveled in feet.

(1) $\dfrac{195}{2}$ (2) $\dfrac{1304}{3}$ (3) 520 (4) 536