Exam 2, MA 162, Fall 2008

*Name in capitals*______________________________________

*Lecturer's name in capitals*______________________________

*Time of lecture*______________________________

*Recitation Instructor's name in capitals*______________________________

*Time of recitation class*______________________________

1. On the scantron, fill in the requested information, most especially, your name, section and division number and your student ID number.
2. On this cover sheet of your exam booklet, fill in your name, your lecturer's name, the time of your lecture. Then fill in your recitation instructor's name and the time of your recitation meeting.
3. There are 12 questions, each worth 8 points. The remaining 4 points are free.
4. Show all your work.
5. No calculators are allowed.

1.E 2.C 3.D 4.A 5.B 6.C
7.B 8.C 9.C 10.E 11.B 12.A

1. Compute $\int_0^1 \frac{dx}{x^2+3x+2}$.

A. $\ln 3 - \ln 2$

B. $\ln 5 - \ln 2$

C. $2\ln 3 - \ln 2$

D. $\ln 5 - 2\ln 2$

E. $2\ln 2 - \ln 3$

2. Find the partial fraction decomposition of the function $\frac{2x-4}{x(x^2+4)}$.

A. $\frac{2}{x} - \frac{x-1}{x^2+4}$

B. $\frac{1}{x} + \frac{2}{x^2+4}$

C. $\frac{-1}{x} + \frac{x+2}{x^2+4}$

D. $\frac{1}{x} + \frac{2x-1}{x^2+4}$

E. $\frac{2}{x} + \frac{x-1}{x^2+4}$

3. Which trigonometric integral arises when one computes $\int \frac{dx}{\sqrt{x^2+2x+5}}$?

A. $\int 2\sec\theta\tan\theta d\theta$

B. $\int 2\tan\theta d\theta$

C. $\int 2\sin\theta d\theta$

D. $\int \sec\theta d\theta$

E. $\int 2\sec^2\theta d\theta$

4. Use the Trapezoidal Rule with $n = 3$ to compute the approximate value of $\int_{-\frac{1}{2}}^{1} x^2 dx$.

A. $\frac{7}{16}$

B. $\frac{3}{8}$

C. $\frac{5}{16}$

D. $\frac{5}{8}$

E. $\frac{1}{2}$

5. Compute $\int_1^2 \frac{dx}{\sqrt{2-x}}$.

A. 4

B. 2

C. $2-\sqrt{2}$

D. $\sqrt{2}-1$

E. $2\sqrt{2}-2$

6. Which statement about $\int_1^\infty \frac{dx}{x^2+x}$ is true?

A. The integral diverges, by comparison with $\int_1^\infty \frac{dx}{x}$

B. The integral converges, by comparison with $\int_1^\infty \frac{dx}{x}$

C. The integral converges, by comparison with $\int_1^\infty \frac{dx}{x^2}$

D. The integral diverges, by comparison with $\int_1^\infty \frac{dx}{x^2}$

E. None of the above statements is true.

7. Which integral represents the area of the surface obtained by revolving the curve $y = 2\sqrt{x}$ from $(0,0)$ to $(1,2)$ about the x-axis?

A. $\int_0^1 2\pi\sqrt{x+4}dx$

B. $\int_0^1 4\pi\sqrt{x+1}dx$

C. $\int_0^1 2\pi\sqrt{2x+1}dx$

D. $\int_0^2 4\pi\sqrt{x+4}dx$

E. $\int_0^2 2\pi\sqrt{x+1}dx$

2/3

8. Compute the length of $y = \frac{2}{3}(1+x)^{3/2}$ from $(0,\cancel{0})$ to $(2, 2\sqrt{3})$.

A. $(8-2\sqrt{2})/3$

B. $2-\sqrt{3}$

C. $(16-4\sqrt{2})/3$

D. $3\sqrt{3}-2\sqrt{2}$

E. $3\sqrt{3}-3\sqrt{2}$

9. Three objects of mass 3 grams, 2 grams and 1 gram are placed at $(2,2)$, $(1,1)$ and $(2,4)$ respectively. Where is the centroid of the system of three objects?

A. $(\frac{3}{2}, 2)$
B. $(\frac{2}{3}, 3)$
C. $(\frac{5}{3}, 2)$
D. $(\frac{4}{3}.2)$
E. $(\frac{3}{2}, \frac{5}{3})$

10. Given that the plane region defined by $0 < y < 1 + x^2$ and $-1 < x < 1$ has area equal to $8/3$, its centroid is at

A. $(\frac{3}{2}, 0)$
B. $(\frac{5}{14}, 0)$
C. $(0, \frac{7}{15})$
D. $(0, \frac{23}{40})$
E. $(0, \frac{7}{10})$

11. Evaluate $\lim_{n\to\infty}(n - \frac{n^2-2n-12}{n})$.

A. 0

B. 2

C -4

D. -2

E. The limit does not exist

12. Evaluate $\lim_{p\to\infty} \frac{\ln(4p+5)}{p}$.

A. 0

B. 1

C. $\ln 4$

D. $\ln \frac{5}{4}$

E. The limit does not exist.