

# Exam 1A

Course ID:	<b>MAC2312</b>
Course Title:	Calculus II
Date of Exam:	June 5th 2013
Duration of Exam:	90 minutes

## Instructions

A. Sign your scantron sheet in the white area on the back in ink.

B. Write and code in the spaces indicated:

- 1) Name (last name, first name, middle initial)
- 2) UF ID number
- 3) Section number

C. Under “special code” code in the test ID numbers 1 (1st row), 1 (2nd row).

- 2 3 4 5 6 7 8 9 0
- 2 3 4 5 6 7 8 9 0

E. While taking the test, please keep your answer sheet covered or turned over at all times.

F. This test consists of 12 multiple choice questions and 4 free response questions. No calculators are allowed.

G. When you are finished:

- 1) Before turning in your test check for transcribing errors. No changes may be made after submitting your scantron.
- 2) You must turn in your scantron and tear off sheets to your instructor. Be prepared to show your picture ID with a legible signature.
- 3) The answers will be posted within one day after the exam.

1. Integrate  $\int \sin(\sqrt{x}) \, dx$

A.  $-\cos(\sqrt{x}) + C$

B.  $x \sin(\sqrt{x}) - \frac{1}{2}\sqrt{x} \sin(\sqrt{x}) - \frac{1}{2} \cos(\sqrt{x}) + C$

C.  $2\sqrt{x} \cos(\sqrt{x}) - 2\sqrt{x} \sin(\sqrt{x}) + C$

D.  $-x \sin(\sqrt{x}) + \frac{1}{2}\sqrt{x} \sin(\sqrt{x}) + \frac{1}{2} \cos(\sqrt{x}) + C$

E.  $-2\sqrt{x} \cos(\sqrt{x}) + 2 \sin(\sqrt{x}) + C$

2. Integrate  $\int \frac{15x}{(x+4)(x^2-3x+2)} \, dx$

A.  $2 \ln|x+4| + 5 \ln|x-2| - 3 \ln|x-1| + C$

B.  $-2 \ln|x+4| + 5 \ln|x-2| - 3 \ln|x-1| + C$

C.  $-2 \ln|x+4| + \ln|x^2-3x+2| + 8 \arctan(2x-3) + C$

D.  $10 \ln|x+4| + \ln|x^2-3x+2| + C$

E.  $10 \ln|x+4| + \frac{5}{3} \ln|x-2| + \ln|x-1| + C$

3. Evaluate  $\int_4^\infty e^{-x/2} \, dx$

A.  $\frac{2}{e^2}$

B.  $\frac{-2}{e^2}$

C.  $\frac{1}{e^2}$

D.  $\frac{-1}{e^2}$

E. The integral diverges.

4. Integrate  $\int \frac{1}{\sqrt{x^2 + 8x}} dx$

A.  $\ln \left| -x - 4 + \sqrt{x^2 + 8x} \right| + C$

B.  $\ln \left| x + 4 + \sqrt{x^2 + 8x} \right| + C$

C.  $\ln \left| -x + 4 + \sqrt{x^2 + 8x} \right| + C$

D.  $\ln \left| x + 4 - \sqrt{x^2 + 8x} \right| + C$

E.  $\ln \left| x + 4 - \sqrt{x^2 - 8x} \right| + C$

5. Integrate  $\int \sqrt{1 - 9x^2} dx$

A.  $\frac{1}{6} \left( \arcsin(3x) - 3x\sqrt{1 - 9x^2} \right) + C$

B.  $\frac{1}{3} \left( \arcsin(3x) - 3x\sqrt{1 - 9x^2} \right) + C$

C.  $\frac{1}{3} \left( \arcsin(3x) + 3x\sqrt{1 - 9x^2} \right) + C$

D.  $\frac{1}{6} \left( \arcsin(3x) + 3x\sqrt{1 - 9x^2} \right) + C$

E.  $\frac{1}{6} \left( \arcsin(3x) + 3x\sqrt{1 + 9x^2} \right) + C$

6. Evaluate  $\int_0^\infty x^2 e^{-x^3} dx$

A.  $-\frac{1}{3}$

B.  $\frac{1}{3}$

C. 1

D. -1

E. The integral diverges.

7. Integrate  $\int x^3 e^{-x} dx$

A.  $\frac{-x^4}{4}e^{-x} + C$

B.  $-e^{-x}(x^3 - 3x^2 + 6x - 6) + C$

C.  $-e^{-x}(x^3 + 3x^2 + 6x + 6) + C$

D.  $\frac{x^4}{4}e^{-x} + C$

E.  $e^{-x}(x^3 - 3x^2 + 6x - 6) + C$

8. Integrate  $\int \frac{4x^2 - 5x - 6}{x^2(x + 2)} dx$

A.  $4 \ln |x| - 3 \ln |x^2| + C$

B.  $-\ln |x| + \frac{3}{x} + 5 \ln |x + 2| + C$

C.  $4 \ln |x| + \frac{3}{x} + C$

D.  $\ln |x| + \frac{3}{x} + 5 \ln |x + 2| + C$

E.  $-\ln |x| - 3 \ln |x^2| + 5x \ln |x + 2| + C$

9. Integrate  $\int (\ln x)^2 dx$

A.  $x(\ln x)^2 - x^2 \ln x - \frac{1}{2}x^2 + C$

B.  $x(\ln x)^2 - 2x \ln x - 2x + C$

C.  $\frac{2}{x} + C$

D.  $x(\ln x)^2 - 2x \ln x + 2x + C$

E.  $2x \ln x - 2x + C$

10. Integrate  $\int \frac{x^2}{(4-x^2)^{3/2}} dx$

A.  $\frac{x}{\sqrt{4-x^2}} - \arcsin\left(\frac{x}{2}\right) + C$

B.  $\frac{\sqrt{4-x^2}}{x} - \arcsin\left(\frac{x}{2}\right) + C$

C.  $\frac{x}{\sqrt{4-x^2}} - \arcsin(x) + C$

D.  $\frac{x}{\sqrt{4-x^2}} + \arcsin\left(\frac{x}{2}\right) + C$

E.  $\frac{\sqrt{4-x^2}}{x} + \arcsin\left(\frac{x}{2}\right) + C$

11. What is the correct form of the partial fraction decomposition for

$$\int \frac{1}{(x^2-4)(x^2+2x+2)^2} dx$$

A.  $\frac{A}{x+2} + \frac{B}{x-2} + \frac{Cx+D}{x^2+2x+2} + \frac{Ex+F}{(x^2+2x+2)^2}$

B.  $\frac{Ax+B}{x^2-4} + \frac{Cx+D}{x^2+2x+2} + \frac{Ex+F}{(x^2+2x+2)^2}$

C.  $\frac{A}{x+2} + \frac{B}{x-2} + \frac{C}{x+2} + \frac{D}{(x+2)^2} + \frac{E}{(x+2)^3} + \frac{F}{(x+2)^4}$

D.  $\frac{A}{x+2} + \frac{B}{x-2} + \frac{C}{x^2+2x+2} + \frac{D}{(x^2+2x+2)^2}$

E.  $\frac{Ax+B}{x^2-4} + \frac{C}{x^2+2x+2} + \frac{D}{(x^2+2x+2)^2}$

12. How many of the following integrals converge ?

$$\int_1^{\infty} \frac{1}{x^2} dx$$

$$\int_1^{\infty} \frac{1}{x^e} dx$$

$$\int_1^{\infty} \frac{1}{x^{\frac{1}{4}}} dx$$

$$\int_1^{\infty} \frac{1}{x^{\pi}} dx$$

$$\int_1^{\infty} \frac{1}{x} dx$$

A. 1

B. 2

C. 3

D. 4

E. 5

MAC2312

Name: \_\_\_\_\_

Exam 1A

Section: \_\_\_\_\_

<b>Instructions:</b> You must show all work to receive full credit.
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1. Integrate  $\int \arctan\left(\frac{1}{x}\right) dx$

2. Integrate  $\int \frac{x^2 - 9x - 16}{(x - 3)(x^2 + 4x + 13)} dx$



3. Integrate  $\int \frac{x^3}{\sqrt{x^2 + 4}} dx$

4. Evaluate  $\int_0^1 \ln(x) \, dx$

University of Florida Honor Code:

On my honor, I have neither given nor received unauthorized aid in doing this assignment.

Signature: \_\_\_\_\_