Disclaimer:

There is no guarantee that the questions on this semester's exam will be similar to the questions on last semester's exam.

Exam 1 covers Chapters 6.1-6.7, 7.1, 7.3, and 7.4. Exam 1 can cover any material from the lectures, homework, quizzes, etc.

MAC 2234
Fall 2019

EXAM 1A

A. Sign your bubble sheet on the back at the bottom in ink.

B. In pencil, write and encode in the spaces indicated:

1) Name (last name, first initial, middle initial)
2) UF ID Number
3) Section Number (The section number for this class is 1936)

C. Under "special codes", code in the test ID number 1, 1.

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

D. At the top right of your bubble sheet, for "Test Form Code", encode A.

● B C D E

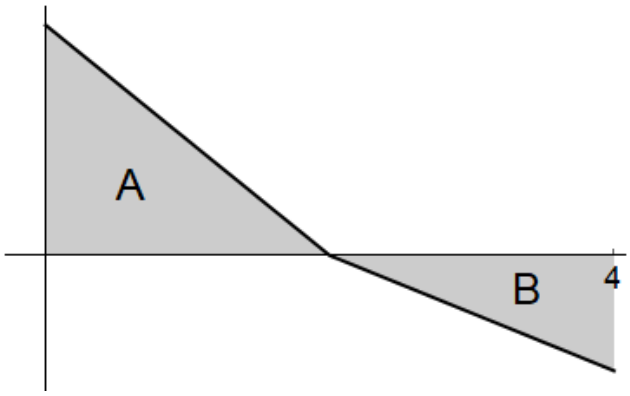
E. 1) This test consists of ten six-point multiple choice questions and four free reponse questions worth 45 points, for a total of 105 points (100 points plus 5 bonus points).
2) The time allowed is 90 minutes.
3) You may write on the test.
4) Raise your hand if you need more scratch paper or if you have a problem with your test. DO NOT LEAVE YOUR SEAT UNLESS YOU ARE FINISHED WITH THE TEST.

F. **KEEP YOUR BUBBLE SHEET COVERED AT ALL TIMES.**

G. When you are finished:

1) Before turning in your test, check for transcribing errors. Any mistakes you leave in are there to stay.
2) Bring your test, scratch paper, and bubble sheet to your proctor to turn them in. Be prepared to show your UF ID card.
3) Answers will be posted in Canvas after the test.

1. The graph of $f(x)$ is shown below on $[0, 4]$. The area of the region A is 5 and the area of the region B is 2. Determine $\int_0^4 3f(x)\,dx$.



A. -7 B. 7 C. 21 D. 9 E. -9

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2. Using the data in the table below, approximate $\int_{-1}^{2} f(x)\,dx$ using the Trapezoidal Rule with three subintervals.

x	-1	0	1	2
$f(x)$	5	8	-6	3

A. $\frac{9}{2}$

B. 6

C. 7

D. 12

E. An approximation cannot be calculated using the given data.

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3. Evaluate $\displaystyle\int \frac{(1+x^5)^2}{x^4}\,dx.$

A. $\displaystyle -\frac{1}{3x^3} + x^2 + \frac{x^7}{7} + C$

B. $\displaystyle x + \frac{x^6}{3} + \frac{x^{11}}{11} + C$

C. $\displaystyle -\frac{(1+x^5)^3}{9x^3} + C$

D. $\displaystyle -\frac{1}{3x^3} - \frac{x^3}{9} - \frac{x^8}{33} + C$

E. $\displaystyle \frac{5}{x^5} + 6x^5 + C$

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4. Evaluate $\displaystyle\int \frac{x^4}{(1+x^5)^2}\,dx.$

A. $\displaystyle \frac{\ln\left|(1+x^5)^2\right|}{5} + C$

B. $\displaystyle 5\ln\left|(1+x^5)^2\right| + C$

C. $\displaystyle \frac{1+x^5}{5} + C$

D. $\displaystyle -\frac{5}{1+x^5} + C$

E. $\displaystyle -\frac{1}{5(1+x^5)} + C$

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5. Determine the area between the curves $y = 2x^2$ and $y = 2$.

A. $\displaystyle \frac{8}{3}$ B. $\displaystyle \frac{4}{3}$ C. $\displaystyle \frac{2}{3}$ D. $\displaystyle \frac{1}{3}$ E. 2

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6. Determine which of the following statements are true.

   I. If $f(x)$ is a continuous function, then $\displaystyle\int_{-3}^{3} f(x)\,dx = \int_{3}^{-3} f(x)\,dx$.

   II. If $f(x)$ is a continuous odd function, then $\displaystyle\int_{-3}^{3} f(x)\,dx = 0$.

   III. If $f(x)$ is a continuous function, then $\displaystyle\int_{-3}^{3} f(x)\,dx = \int_{-3}^{0} f(x)\,dx + \int_{0}^{3} f(x)\,dx$.

   A. II only B. III only C. I and III only

   D. II and III only E. I, II, and III

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7. Determine the convergence or divergence of $\displaystyle\int_{1}^{\infty} \frac{4}{\sqrt{4x}}\,dx$.

   A. Convergent. Its value is $\frac{1}{2}$.

   B. Convergent. Its value is 4.

   C. Convergent. Its value is 2.

   D. Convergent. Its value is ∞.

   E. Divergent.

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8. Given $f(x) = \left(\frac{x-5}{2}\right)^2$, calculate $\displaystyle\sum_{n=4}^{7} f(n)$.

   A. $\frac{1}{2}$ B. 1 C. $\frac{3}{2}$ D. $\frac{5}{4}$ E. 2

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9. For the next ten years, a small business plans to reinvest an income stream of \$3,000 per year at a rate of 5% per year compounded continuously. Determine the present value of the income stream. Round your answer to the nearest dollar.

   A. \$4,946 B. \$23,608 C. \$98,923 D. \$38,923 E. \$1,820

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10. Determine $f(x)$ if $f'(x) = \ln(x) + \dfrac{2}{x}$ and $f(1) = 2$.

A. $(x+2)\ln(x) + 2$

B. $\dfrac{1}{x} + 2\ln|x| + 1$

C. $x\ln(x) - x + 2\ln|x| + 3$

D. $x(2 + \ln|x|)$

E. $\dfrac{1}{x} - \dfrac{2}{x^2} + 3$

Section # _____ Name _____

UF ID # _____ Signature _____

YOU MUST SHOW ALL WORK TO RECEIVE FULL CREDIT.

If you need more space, use scratch paper. Write your name on the top of the scratch paper, and clearly indicate the question(s) being answered.

1. Approximate the average value of $f(x) = \dfrac{18}{x^2+2}$ on $[0, 6]$ using a Left Riemann Sum with three subintervals. Simplify your final answer.

2. Evaluate $\displaystyle\int (2x+1)e^x \, dx$.

3. Evaluate $\int_{-\infty}^{1} e^{4x}\,dx$. State whether it is convergent or divergent.

4. The quantity x of burgers (in hundreds) that a restaurant will supply per week is related to the unit price p (in dollars) by $p = 2 + \dfrac{x^2}{4}$. Determine the producers' surplus if each burger is sold for \$3.

$\overline{p} =$ _____ $\overline{x} =$ _____ *Producers' Surplus* = _____