

Seat #: \_\_\_\_\_

Special number: \_\_\_\_\_

Instructions:

- Please show all of your work as partial credit will be given where appropriate, **and** there may be no credit given for problems where there is no work shown.
- All answers should be completely simplified, unless otherwise stated.
- There are no calculators or any sort of electronics allowed on this exam. Make sure all cell phones are put away and out of sight. If you have a cell phone out at any point, for any reason, you will receive a zero on this exam.
- You will be given an opportunity to ask clarifying questions about the instructions about five or ten minutes after the exam has started (for a couple minutes). The questions will be answered for the entire class. After that, no further questions will be allowed, for any reason.
- You must show us your U of U student ID card when finished with the exam.
- The exam key will be posted on Canvas by this afternoon.
- You may ask for scratch paper. You may use NO other scratch paper. Please transfer all finished work onto the proper page in the test for us to grade there. We will not grade the work on the scratch page.
- You are allowed to use one 8.5x11 inch piece of paper with notes for your reference during the exam.
- There is a table of integrals attached to the back of this exam. You may use it only for the question that asks you to use it. Otherwise, you must use your own brain to compute each integral.

(This exam has nine problems, each worth 12 points, for a total of 108 points. I'll take that score out of 100 to build in a cushion of extra credit points.)

STUDENT—PLEASE DO NOT WRITE BELOW THIS LINE. THIS TABLE IS TO BE USED FOR GRADING.

Problem	Score	Problem	Score	Problem	Score	Problem	Score	Problem	Score
1		3		5		7		9	
2		4		6		8			

Total:	
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**Here are some questions to help prompt yourself while doing the integrals.**

1. Is this integral indefinite (so it's the antiderivative and your answer should be a function of  $x$ , plus an arbitrary constant) or definite (there are limits of integration and your answer should be a number)?

If it's a definite integral, is it improper?

(a) is one or both of the limits some sort of infinity?

(b) is the interval over which it's integrating butting up to or crossing a VA?

2. Which technique might be useful to compute the integral?

it's a straight forward integral

simple  $u$ -substitution

fancy  $u$ -substitution

integration by parts

trigonometric integral—use Pythagorean identities

trigonometric integral—use half-angle identity

trigonometric substitution (with right triangle)

partial fraction decomposition—without long division

partial fraction decomposition—with long division

**Evaluate each of these integrals or limits. Unless otherwise specified, evaluate all integrals without using the attached integral table. Each question is worth 12 points.**