

Math 242 Exam 2, Spring 2023

Name:

Section: 7 8

| Question | Points | Score |
|----------|--------|-------|
| 1 | 1 | |
| 2 | 6 | |
| 3 | 8 | |
| 4 | 10 | |
| 5 | 6 | |
| Total: | 31 | |

- You have 75 minutes to complete this exam.
- Please ask if anything seems confusing or ambiguous.
- You must show all your work unless the problem states otherwise. You will get almost no credit for solutions that are not fully justified.
- You may not use notes or calculators on this exam.
- You do not need to simplify your answers.
- Good luck!

| | |
|------------|--|
| Homework | |
| Worksheets | |
| Quizzes | |
| Exam 1 | |
| Exam 2 | |
| Total | |

1. (1 point) Don't forget to write your name and circle your section!
2. (a) (3 points) Use the Trapezoidal Rule with $n = 4$ to approximate the integral $\int_{-1}^3 x^3 dx$.

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- (b) (3 points) How large should n be to guarantee that Simpson's Rule S_n is within 10^{-4} of $\int_0^2 x \sin x dx$. This might help: the fourth derivative of $f(x) = x \sin x$ is $f^{(4)}(x) = 4 \sin x + x \cos x$.

3. (a) (4 points) Find $\int \tan^3 x \sec^3 x \, dx$.

(b) (4 points) Find $\int \frac{dx}{\sqrt{x^2 - 9}}$.

4. (a) (4 points) Find $\int_2^3 \frac{3}{\sqrt{x-2}} dx$.

(b) (6 points) Find $\int_0^\infty \frac{1}{x^2 - 2x + 2} dx$.

5. (a) (2 points) Write the abstract partial fraction decomposition of $\frac{x^3 - x^2 - 17}{x^3(2x - 1)^2(x^2 + x + 4)^3}$.

(b) (4 points) Find $\int \frac{2}{x^2 - 9} dx$.