

Final Exam Information

Each answer on the final has the form of a single number, a single mathematical expression, or a short phrase. The answer itself will be worth **up to** 2 points. Place each final answer in the box at the bottom of the corresponding problem. When giving decimal answers, round your final answer to 4 decimal places. Any intermediate computations should be rounded to more places so that the answer is correct to 4 places.

For full credit, every problem should have supporting work or an explanation. Your work should support your answer. Please don't give work that supports an answer different from the one you provide. The work is worth **up to** 3 points. The supporting work will be scored as follows:

- 0 points - No work or no correct work/explanation
- 1 point - Some correct ideas and work/explanation
- 2 points - The ideas and work/explanation are mostly correct
- 3 points - The ideas, notation, and work/explanation are correct

Math 132 - Final Exam A

May 7, 2021

Name _____

Score _____

Show all work to receive full credit. This test is due May 12.

1. The region bounded by the graphs of $y = x^2 - 4x + 6$, $y = x - 1$, $x = 1$, and $x = 3$ is rotated about the y -axis to form a solid. Set up the definite integral that gives the volume of the solid. Then use your calculator (or computer) to evaluate the integral.

2. Use the trapezoid rule with $n = 4$ to approximate $\int_1^3 e^{-x^2} dx$. Round your final answer to 4 digits. (Use enough decimal digits in your work so that your final answer has four correct digits.)

3. Use a trigonometric substitution to evaluate $\int \frac{5 dx}{(x^2 + 9)^{3/2}}$.

4. Find the interval of convergence of the power series $\sum_{n=0}^{\infty} \frac{(x-2)^n}{3^n n^2}$.

5. Let $f(x) = 1/x$. Find the first five terms of the Taylor series for f centered at $x = 1$.

6. Eliminate the parameter t to obtain an equation for y in terms of x . State the domain and range of the resulting function.

$$x = e^{2t}, \quad y = e^t, \quad -\infty < t < \infty$$

7. Consider the curve described by the parametric equations

$$x = 2t + 1, \quad y = 3t^2 + 1, \quad -1 \leq t \leq 2.$$

Find the area of the region between the curve and the x -axis.

8. (a) Convert the point $(r, \theta) = \left(7, \frac{5\pi}{4}\right)$ to rectangular coordinates.

(b) Convert the point $(x, y) = (-5, -5)$ to polar coordinates.