$\mathcal{N}ame$: _____

$\mathcal{S}tudent\ Number$: _____

Show all work clearly and in order, circle your final answer.
You may use the back as an answer sheet provided you explicitly mention you're doing so.
This quiz is comprised of 4 problems which you have 20 minutes to solve.

1. (*5 points*) Evaluate the following integral

$$\int e^x ln(e^x)dx$$

2. (*5 points*) Evaluate the following integral

$$\int (1 - \tan^2 \theta)\sec^2 \theta d\theta$$

3. (*5 points*) Evaluate the following integral

$$\int \frac{5x^3 - 3x^2 + 2x - 1}{x^4 + x^2}\,dx$$

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Show all work clearly and in order, circle your final answer.
You may use the back as an answer sheet provided you explicitly mention you're doing so.
This quiz is comprised of 4 problems which you have 25 minutes to solve.

1. (*5 points*) Evaluate the following integral

$$\int \frac{\sqrt{x^2 - 1}}{x^4} dx$$

2. (*5 points*) Find the volume of the solid obtained by rotating the region about the x-axis bounded by:

$$y = \sqrt{49 - x^2}, y = 0, x = 1, x = 3$$

3. (*5 points*) Use the method of **cylindrical shells** to find the volume generated by rotating the region about the x-axis bounded by:

$$x = \sqrt{y}, x = 0, y = 1.$$

4. (*5 points*) Find the length of the curve $y^2 = x^3$, between $1 \le x \le 4$.

$\mathcal{N}ame$ (f,l): _____

$\mathcal{S}tudent\ Number$: _____

Show all work clearly and in order, circle your final answer.
This quiz is comprised of 3 problems which you have 20 minutes to solve.

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1. (*5 points*) Does the following series converge or diverge? If it converges, what does it converge to? Justify your work.

$$4 + 3 + \frac{9}{4} + \frac{27}{16} + ...$$

2. (*5 points*) Does the following series converge or diverge? Justify your work.

$$\sum_{n=1}^{\infty} \frac{5+n}{1-10n}$$

3. (*5 points*) Does the following series converge or diverge? Justify your work.

$$\sum_{n=1}^{\infty} \frac{1}{\sqrt{n+1} + \sqrt{n}}$$

BONUS:
- (*1 point*) What is my name? (JUST first name, no last name):
- (*2 points*) When and where are my office hours? (day, hour and room):

$\mathcal{N}ame$ (f,l): _____

$\mathcal{S}tudent\ Number$: _____

Show all work clearly and in order, circle your final answer.
This quiz is comprised of 3 problems which you have 20 minutes to solve.

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1. (*5 points*) Use the Alternating Series Test to determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n+1}}$$

2. (*5 points*) Use the Root Test to determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} \left(\frac{3n+2}{n^3+1}\right)^{2n}$$

3. (*5 points*) Find the Interval and Radius of convergence of the following power series.

$$\sum_{n=1}^{\infty} \frac{(x-2)^n}{\sqrt{n}}$$

BONUS

Complete the following statements:

- (*1 point*) A series $\sum_{n=1}^{\infty} a_n$ is called **Absolutely convergent** if ...

- (*1 point*) The Ratio Test is **inconclusive** if ...

$\mathcal{N}ame$ (f,l): _____

$\mathcal{S}tudent\ Number$: _____

Show all work clearly and in order, circle your final answer.
This quiz is comprised of 3 problems which you have 25 minutes to solve.

1. (*5 points*) Find the Taylor Series for the following function:

$$f(x) = x^5 + 4x^2 + x + 1, \ \ centered\ at\ a = 2$$

2. (*5 points*) Find the Maclaurin Series and the radius of convergence for:

$$f(x) = e^{-2x}$$

3. (*5 points*) Solve the differential equation for the following problem:

$$xyy' = x^2 + 1 \ \ at \ (1, 2)$$

BONUS
Make me laugh! Write down a joke, draw something funny, etc. just nothing inappropriate.
You can get up to 3 bonus points.