

Name: _____ PID: _____

- Print your *NAME* on every page and write your *PID* in the space provided above.
 - Show all of your work in the spaces provided. No credit will be given for unsupported answers, even if correct.
 - No calculators, tablets, phones, or other electronic devices are allowed during this exam. You may use one page of handwritten notes, but no books or other assistance.
 - Any real valued answers should not include the imaginary number i .
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(1 pt) 0. Follow the instructions on this exam and any additional instructions given during the exam.

(6 pt) 1. Determine if $\sum_{n=2}^{\infty} \frac{3^n - 2}{9^n}$ converges or diverges. If it converges, to what value does it converge?

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(6 pt) 2. Evaluate the integral $\int \sin(7x) \cos(3x) dx$.

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(6 pt) 3. Evaluate the integral $\int \frac{2x + 4}{(x^2 + 1)x^2} dx$.

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- (6 pt) 4. Determine if the integral converges or diverges. If it converges, to what value does it converge?

$$\int_1^{\infty} \frac{1}{x^2 \sqrt{1+x^2}} dx$$