

Instructions

1. Write your Name and PID in the spaces provided above.
 2. Make sure your Name is on every page.
 3. No calculators, tablets, phones, or other electronic devices are allowed during this exam.
 4. Put away ANY devices that can be used for communication or can access the Internet.
 5. You may use one handwritten page of notes, but no books or other assistance during this exam.
 6. Read each question carefully and answer each question completely.
 7. Write your solutions clearly in the spaces provided. Work on scratch paper will not be graded.
 8. Show all of your work. No credit will be given for unsupported answers, even if correct.
-

(1 point) 0. Carefully read and complete the instructions at the top of this exam sheet and any additional instructions written on the chalkboard during the exam.

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

(3 points) 2. Evaluate the indefinite integral $\int e^{-i3x} \sin(4x) dx$. Leave the result in exponential form.

(3 points) 3. Let $\{a_n\}$ be the sequence whose n^{th} term is defined by $a_n = \sqrt{n+3} - \sqrt{n}$.
Determine $\lim_{n \rightarrow \infty} a_n$.

(6 points) 4. Evaluate the indefinite integral $\int \frac{2x^2 - 9x - 11}{(x - 1)(x + 2)(x - 3)} dx$.

- (6 points) 5. Determine which of the following improper integrals converge and justify your conclusion. In order to earn credit you must supply a correct justification.

(a) $\int_1^{\infty} \frac{1 + \sin^2(x)}{\sqrt{x}} dx$

(b) $\int_0^1 \frac{1 + \sin^2(x)}{\sqrt{x}} dx$