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By signing here, you agree to abide by the **Georgia Tech Honor Code**: *I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech Community.*

Sign Your Name: \_\_\_\_\_

For Question (0.) below please list any **outside resources** you used to help solve quiz problems. You can use calculators, textbook/course documents, websites, solving tools, or each other (e.g., TI-89 calculator, textbook formula sheet on page 281, 3Blue1Brown YouTube video on integrals, WolframAlpha, Symbolab). **Be specific.** List the name of anyone who helped you. If you used no outside resources, write N/A.

As always, anything you submit must be your own work. Never submit the work of someone else.

Please clearly organize your work, show all steps, simplify all answers, and BOX your answers.

0. (1 point) *Full credit for accurately following the directions above.*

1. (4 points) Find a general formula  $a_n$  for the  $n$ -th term of the sequence. You do not need to show work on this problem but please put your final answer in the box.

*Hint: be sure to include your starting value for  $n$ .*

$$0, \frac{3}{5}, \frac{8}{25}, \frac{15}{125}, \frac{24}{625}, \dots$$

2. (10 points) Evaluate the improper integral. *Note: there is a third page to the quiz this week.*

$$\int_2^{\infty} \frac{1}{x\sqrt{x^2-1}} dt$$

3. (6 points) For each sequence, determine the limit of the sequence as  $n$  tends to infinity. If the limit diverges, write either DNE,  $\infty$  DNE, or  $-\infty$  DNE in the box, as appropriate. You do not have to show your work for problems on this page, but please put your final answer in the box.

(a)  $\left\{ \left( 1 + \frac{3}{n} \right)^{2n} \right\}$

(b)  $\left\{ \frac{n!}{e^n} \right\}$

(c)  $\left\{ \frac{(-1)^n}{n+1} \right\}$