Math 1552 Summer 2023 **Name (Print):** _____
Quiz 4 June 15
Time limit: 20 Minutes Teaching Assistant/Section: _____

GT ID: | | | | | | | | | |

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: _____

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

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.

   $$\frac{1}{3}, \frac{2}{6}, \frac{2^2}{9}, \frac{2^3}{12}, \frac{2^4}{15}, \ldots$$

2. (10 points) Evaluate the improper integral.

   $$\int_2^{\infty} \frac{2x}{(x^2+1)^2}\, dt$$

3. (6 points) For each sequence, determine the limit of the sequence as n tends to infinity. If the limit diverges, write either DNE, ∞ 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) $\left\{\left(1-\frac{2}{n}\right)^n\right\}$

(b) $\left\{\frac{3^n}{n!}\right\}$

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