Math 1552
Summer 2023
Quiz 1 *QUP only*
May 25
Due date: Sunday at 11:59PM

Name (Print): _____

Canvas email: _____

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: _____

For Question (0.) below please list any **outside resources** you used to help solve quiz problems. You can use calculators, texbook/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. (5 points) Give the **general** anti-derivative of the following function:

$$f(x) = \frac{\sqrt{x}+1}{3x} + 2e^{2x} - \frac{1}{4+x^2}$$

2. (4 points) Suppose $f(x)$ is an even function and $g(x)$ is an odd function. If $\int_{-3}^{0} f(x)\,dx = 4$ and $\int_{0}^{3} g(x)\,dx = 5$, find $\int_{-3}^{3} f(x) + 2g(x)\,dx$.

3. (10 points) Suppose $f(x) = x^2 - 1$. Use a general Riemann Sum

$$\lim_{n\to\infty} \sum_{k=1}^{n} f(x_k^*)\Delta x$$

to evaluate the definite integral of $f(x)$ on the interval [1,2], by following these steps:

(a) Find the length of each subinterval Δx in terms of n. $\Delta x =$ [ ]

(b) Evaluate x_k^* as the right-hand endpoint of the subinterval. $x_k^* =$ [ ]

(c) Evaluate the function at x_k^*, i.e. find $f(x_k^*)$. *Simplify.* $f(x_k^*) =$ [ ]

(d) Using the following summation formulas to simplify the sigma notation, find an expression for $R_n = \sum_{k=1}^{n} f(x_k^*)\Delta x$ that does not involve sigma's.

$\sum_{k=1}^{n} k = \frac{n(n+1)}{2}$ $\qquad$ $\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$

(e) Using the sum you found in the previous step, find the definite integral.