

Math 1552  
Summer 2022  
Test 1  
June 9, 2022

Name (Print): \_\_\_\_\_

Canvas email: \_\_\_\_\_

Time Limit: 50 Minutes

Teaching Assistant/Section: \_\_\_\_\_

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GT ID:

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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: \_\_\_\_\_

1. (5 points) Let  $f(x)$  be a function that is always increasing in the interval  $[1, 5]$ . Suppose  $\int_1^5 f(x)dx = 10$ .

If we use 4 sub-intervals and left-hand endpoints to estimate the area under the curve  $f(x)$  bounded by  $x = 1$  and  $x = 5$ , would it be larger or smaller than 10? Explain your answer.

2. (5 points) Let  $f(x)$  be an even function. Suppose that  $\int_{-5}^5 f(x)dx = 20$  and  $\int_8^5 f(x)dx = -2$ . Find  $\int_0^8 f(x)dx$ ?

3. (5 points) Find  $F'(x)$  if

$$F(x) = \int_{\frac{x^3}{3}}^{e^{2x}} \ln(\sqrt{t+3}) dt.$$

You do not have to simplify your answer.

4. (5 points) Evaluate

$$\int \frac{1}{\sqrt{1-4x^2}} dx$$

5. (10 points) Use the method of substitution to calculate the integral:

A correct answer without work will not receive full credit.

$$\int_1^e \frac{1}{x(1 + \ln x)} dx$$

6. (10 points) Use integration by parts to calculate the integral:

A correct answer without work will not receive full credit.

$$\int (5x^2 - 2x) \sin(2x) dx.$$

7. (10 points) Use trigonometric identities to calculate the integral:

A correct answer without work will not receive full credit.

$$\int \sin^2(3x) \cos^3(3x) dx.$$