

Math 1552
Spring 2019
Quiz 6 6:00pm
February 28, 2019
Time Limit: 15 Minutes

Name (Print): _____

Canvas email: _____

Teaching Assistant/Section: _____

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: _____

This quiz contains 2 pages (including this cover page) and 2 problems. Check to see if any pages are missing. Enter all requested information on the top of this page.

You may *not* use your books, notes, or any calculator on this quiz.

You are required to show your work on each problem on this quiz. The following rules apply:

- **If you use a “fundamental theorem” you must indicate this** and explain why the theorem may be applied.
- **Organize your work**, in a reasonably neat and coherent way, in the space provided. Work scattered all over the page without a clear ordering will receive very little credit.
- **Mysterious or unsupported answers will not receive full credit.** A correct answer, unsupported by calculations, explanation, or algebraic work will receive no credit; an incorrect answer supported by substantially correct calculations and explanations might still receive partial credit.
- Please circle or box in your final answer.

Problem	Points	Score
1	15	
2	5	
Total:	20	

1. (15 points) Evaluate the following improper integral:

$$\int_3^4 \frac{2x}{\sqrt{x^2-9}} dx$$

$$\int_b^4 \frac{2x}{\sqrt{x^2-9}} dx = \int_{x=b}^{x=4} \frac{du}{\sqrt{u}} = 2\sqrt{u} \Big|_{x=b}^{x=4} = \frac{2\sqrt{x^2-9} \Big|_b^4}{+6} = 2\sqrt{7} - 2\sqrt{b^2-9}$$

$$u = x^2 - 9$$

$$du = 2x dx$$

$$\int_3^4 \frac{2x}{\sqrt{x^2-9}} dx = \boxed{\lim_{b \rightarrow 3^+} \int_b^4 \frac{2x}{\sqrt{x^2-9}} dx} = \lim_{b \rightarrow 3^+} (2\sqrt{7} - 2\sqrt{b^2-9}) = \frac{2\sqrt{7}}{+3} = \underline{2\sqrt{7}} \quad +2$$

2. (5 points) Determine whether the sequence converges or diverges. If it converges, find the limit.

$$a_n = 8^{1/n}$$

$$\lim_{n \rightarrow \infty} 8^{1/n} = 8^0 = 1 \quad +3$$

The sequence converges +2