

MARK BOX		
PROBLEM	POINTS	
1	1	
2	1	
3	1	
4	1	
5	1	
6	1	
7	4	
%	10	

NAME: _____

CLASS PIN: _____

INSTRUCTIONS:

- (1) To receive credit you must:
 - (a) **work in a logical fashion, show all your work, indicate your reasoning;**
no credit will be given for an answer that *just appears*;
such explanations help with partial credit
 - (b) if a line/box is provided, then:
 - show you work **BELOW** the line/box
 - put your answer on/in the line/box
 - (c) if no such line/box is provided, then box your answer
 - (2) The MARK BOX indicates the problems along with their points.
Check that your copy of the exam has all of the problems.
 - (3) You may **not** use a calculator, books, personal notes.
 - (4) During this exam, do not leave your seat. If you have a question, raise your hand. When you finish: turn your exam over, put your pencil down, and raise your hand.
 - (5) This exam covers (from *Calculus (ET) Stewart 6th ed.*):
 - (a) Sections 7.1 – 7.5, 7.8 for the inclass problems
 - (b) Section 11.1 for the take home part.
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Problem Inspiration: See the answer key.

Honor Code Statement

I understand that it is the responsibility of every member of the Carolina community to uphold and maintain the University of South Carolina's Honor Code.

As a Carolinian, I certify that I have neither given nor received unauthorized aid on this exam.

Furthermore, I have not only read but will also follow the above Instructions.

Signature : _____

⊙. For the following **SEQUENCES**:

- if the limit exists, find it
- if the limit does not exist, then say that it DNE.

Put your ANSWER IN the box and show your WORK BELOW the box.

1.

$$\lim_{n \rightarrow \infty} \frac{(2n + 1)(5n + 2)}{17n^2} =$$

2.

$$\lim_{n \rightarrow \infty} \frac{5n + 2}{17n^2} =$$

3.

$$\lim_{n \rightarrow \infty} \frac{5n^2 + 2}{17n} =$$

4.

$$\lim_{n \rightarrow \infty} (0.999999917)^n =$$

5.

$$\lim_{n \rightarrow \infty} (1.000000000000017)^n =$$

6. A sequence $\{a_n\}$ has the **limit** L , written as

$$\lim_{n \rightarrow \infty} a_n = L,$$

if

for every $\varepsilon > 0$

(Finish filling in the box with the proper Definition 2 (not Def. 1) on page 677. I started you out)

7. Prove that

$$\lim_{n \rightarrow \infty} \left(17 - \frac{1}{n^2} \right) = 17$$

by using the definition of limit in the previous problem. An outline of the proof is provided, you just need to fill in the blanks.

Proof: Fix _____ .

Pick a natural number $N \in \mathbb{N}$ so big that _____ ,

which we can do by Archimedes Principle.

Fix $n > N$.

Then $|a_n - L| =$ _____ .