

MA 113 CALCULUS I, SPRING 2020
WRITTEN ASSIGNMENT #6

Instructions: The purpose of this assignment is to develop your ability to formulate and communicate mathematical arguments. Your complete assignment should have your name and section number on each page, be stapled, and be neat and legible. *Unreadable work will receive no credit.*

You should provide well-written, complete answers to each of the questions. We will look for correct mathematical arguments, complete explanations, and correct use of English. Your solution should be formulated in complete sentences. As appropriate, you may want to include diagrams or equations written out on a separate line. You may read your textbook to find examples of how we communicate mathematics.

Students are encouraged to use word-processing software to produce high quality solutions. However, you may find that it is simpler to add graphs and equations using pen or pencil.

1. Evaluate $\lim_{x \rightarrow 0} \frac{e^x - x - 1}{\cos x - 1}$.

2. A warehouse selling cement has to decide how often and in what quantities to reorder. It is cheaper, on average, to place large orders, because this reduces the ordering cost per unit. On the other hand, larger orders mean higher storage costs. The warehouse always reorders cement in the same quantity, q . The total weekly cost, C , of ordering and storage is given by

$$C = \frac{a}{q} + bq,$$

where a and b are positive constants.

- (a) Which of the terms a/q and bq represents the ordering cost and which represents the storage cost?
- (b) What value of q gives the minimum total cost?