

MA 113 CALCULUS I, SPRING 2017
WRITTEN ASSIGNMENT #1
Due Friday, January 20, 2017, at beginning of lecture

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. (5 points) A man of height 2.3 meters is standing x meters away from a 6.7-meter lamppost. Let L denote the length of the man's shadow.
 - (a) Draw a diagram and label the diagram appropriately.
 - (b) Use similar triangles to express L as a function of x .
 - (c) Find L when $x = 23$.
2. (5 points) Suppose that a population of animals triples every year, with an initial population of 120.
 - (a) Express the population $P(t)$ after t years as a function of t .
 - (b) Explain why this formula is correct when $t = 4$.
 - (c) How long does it take for the population to reach 5000? Explain your work. (You may use a calculator to compute your final answer, but you need to show the rest of your work without using a calculator.)