Instructions: Use LaTeX to typeset a document containing each component described below. Turn in your lab by emailing it to jamesju@mnstate.edu.

You should email both your raw TeX (.tex) file and your compiled document (in .ps *or* .pdf form). This assignment is due by 4:00pm next Monday. You will be graded on both your raw TeX code and the accuracy of your compiled document.

1. Make sure to load the "amsthm" package in the preamble or your document.

2. Use the `\newtheorem` command to define an enumerated theorem environment, an enumerated axiom environment, and any others as needed.

3. Use a combination of enumerate and environment commands (including the proof environment) to produce the following:

   Theorem 3.1. *A sheet of writing paper is a lazy dog.*

   Proof. A sheet of paper is an ink-lined plane. An inclined plane is a slope up. A slow pup is a lazy dog. Therefore, a sheet of writing paper is a lazy dog. □

   Theorem 3.2. *A peanut butter sandwich is better than eternal happiness.*

   Proof. A peanut butter sandwich is better than nothing. But nothing is better than eternal happiness. Therefore, a peanut butter sandwich is better than eternal happiness. □

   Theorem 3.3. *The Crocodile Theorem A crocodile is longer than it is wide.*

   Proof. A crocodile is long on the top and the bottom, but it is green only on the top; consequently, a crocodile is longer than it is green. A crocodile is green along both its length and width, but it is wide only along its width; consequently, a crocodile is greener than it is wide. Therefore, a crocodile is longer than it is wide. □

   Theorem 3.4. *Every horse has an infinite number of legs.*

   Proof. Horses have an even number of legs. Behind they have two legs, and in front they have fore legs. This makes six legs, which is certainly an odd number of legs for a horse. But the only number that is both odd and even is infinity. Therefore, horses have an infinite number of legs. □

4. Continue using appropriate environments to create the following:

   Axiom 4.1. *If an animal is carnivorous, then it prowls at night.*

   Axiom 4.2. *If an animal loves to gaze at the moon, then it is suitable for a pet.*

   Definition 4.1 (**Nurse**). *A person who wakes you up to give you sleeping pills.*

   Definition 4.2 (**Lecture**). *The art of transferring information from the notes of the Lecturer to the notes of the students without passing through the minds of either.*

   Definition 4.3 (**Compromise**). *The art of dividing a cake in such a way that everybody believes they got the biggest piece.*

5. Use \newcommand to define a command that accomplishes each of the following. Perform two sample calculations with each one.

   (a) Create a command which, when given as input 2 real numbers, outputs an algebraic expression that uses the first number as a base and the second number as an exponent.

   (b) Create a command which, when given as input 4 real numbers, it outputs an algebraic expression representing the mean of the four numbers.

   (c) Create a command which typesets an expression of the form $\sum_{i=k}^{n} \frac{i+1}{i^2}$, and which allows the user to input specific values for k and n, but that defaults to a value of 1 for k and a value of ∞ for n if no values are input.

   (d) Define your own command. Make sure that it has at least 3 inputs and at least two operations.