Assignment # 2
MATH/STAT 2300
Winter 2016

This assignment is **due** at the **beginning of class on Thursday, February 11**. All page numbers refer to the text "A First Course in Mathematical Modeling (5th ed.)" (MM). **If you are using a different edition, it is your responsibility to make sure you are working on the correct problems!**

1. (a) Why do you suppose that the model developed in class for stopping distance is questionable? Where does it seem to work well and where does it seem to fail?
(b) Use the model developed in class to estimate the stopping distance for the following speeds: (i) 22.5 mph (ii) 78 mph (iii) 120 mph (iv) 50 fps (feet per second)

2. (a) Redo the traffic flow model if the highway only services trucks with an average length of $b = 25$ feet.
(b) What happens to the optimal speed for traffic flow as b gets large? Explain your answer.

3. The following table contains data collected on the hearts of mammals:

Animal	Heart Weight (g.)	Length of cavity of left ventricle (cm.)
Mouse	0.1300	0.5500
Rat	0.6400	1.0000
Rabbit	5.8000	2.2000
Dog	102	4.0000
Sheep	210	6.5000
Ox	2030	12.0000
Horse	3900	16.0000

Are the hearts of mammals geometrically similar? Explain your reasoning.

4. Pg. 79, exercise 12 (note: in Maple, the function e^x is written as "exp(x)").

5. Here is a common rule used to estimate a person's weight (in lbs.) given his or her height (in inches):
- for a female, multiply her height by 3.5 and subtract 108
- for a male, multiply his height by 4.0 and subtract 128

Gather some data for people of both genders? does your data support your model? Support your answer.