MATH 121 Section 02
Homework 2

Below is a list of selected problems from Stewart's Calculus. The first problems are suggested exercises and you do not need to turn them in. The latter set you should write up carefully and neatly as they will be graded. It is in your best interest to work all of the problems. All problems from the homework are fair game on the exams! You are encouraged to work in groups, but you must write up your own solutions. I will be available during office hours for help.

1 Suggested Problems

§2.4) 1, 3, 5, 13, 15, 19, 23, 25, 31

§2.5) 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 33, 35, 43, 45

§2.6) 1, 3, 7, 9, 11, 15, 17, 19

2 Required Problems

1) For what value of the constant c is the function f continuous on $(-\infty, \infty)$?

$$f(x) = \begin{cases} x^2 - c^2 & \text{if } x < 4 \\ cx + 20 & \text{if } x \geq 4 \end{cases}$$

2) Is there a number that is equal to 1 more than its cube? Prove it.

3) Use the Intermediate Value Theorem to prove that there is a number c such that $c^2 = 2$. (This proves the existence of the number $\sqrt{2}$.)

4) If an arrow is shot upward on the moon with a velocity of 58 m/s, its height (in meters) after t seconds is given by $H = 58t - 0.83t^2$.

   a) Find the velocity of the arrow after one second.

   b) Find the velocity of the arrow when $t = a$.

   c) When will the arrow hit the moon?

   d) With what velocity will the arrow hit the moon?