MATH 241: ANALYSIS IN SEVERAL REAL VARIABLES I
HOMEWORK #6

PROBLEMS (FOR ALL)

3.2.1
3.2.3
3.2.4
3.2.6
3.2.8
3.2.12
3.3.2
3.3.3

PROBLEMS (FOR GRAD STUDENTS)

3.1.A:

   (a) Let $g : \mathbb{R} \to \mathbb{R}$ be defined by

$$f(x) = \begin{cases} 3x, & \text{for } x \leq 1/2; \\ 3 - 3x, & \text{for } x \geq 1/2. \end{cases}$$

   Show that the set

$$F = \{x \in [0,1] : f^n(x) \in [0,1] \text{ for all } n \in \mathbb{N}\}$$

   is equal to the Cantor set C.
   (b) Use part (a) to show that the map $g : C \to [0, 1/3] \cap C$ defined by $g(x) = x/3$ is a bijection of C to a subset of itself.

3.2.14