Assignment 5 (for discussion and quizzing at tutorial week of Feb 10, but not for hand-in)

- Read Lecture 5 and sections 3.4-3.6 from the textbook.
- Practice problem set:
- 3.4: # 5, 9, 12, 14, 15, 19, 21, 27, 29, 33, 41, 45, 47, 50, 61, 69, 75, 97 p 205-208
- 3.5: # 7, 15, 17, 19, 21, 29, 31, 37, 39, 53, 55, 57, 60 p 215-216
- 3.6: # 3, 7, 15, 19, 21, 26, 27, 30, 39, 41, 45, 49, 50, 55 p 223

<u>Extra questions</u>:

1. If $f(x) = x^{-n}, n \in \mathbb{N}$, prove that
$$f^{(k)}(x) = (-1)^k \frac{(n+k-1)!}{(n-1)!} x^{-n-k}, \qquad x \neq 0$$
   (Hint: Use math induction.)

2. Prove that it is impossible to write $x = f(x)g(x)$ where f and g are differentiable and $f(0) = g(0) = 0$. (Hint: Differentiate.)