Homework 04

1. Section 3.5: problems 17, 33(a), 34(a), 49 (Hint: what is the definition of $\left.\frac{d\sin\theta}{d\theta}\right|_{\theta=c}$?), 57, 58.

2. Section 3.5: Let $f(x) = \begin{cases} \dfrac{\sin x}{x}, & x \neq 0 \\ 1, & x = 0 \end{cases}$

   (a) Is f continuous at $x = 0$?

   (b) (Optional and difficult!) Is f differentiable at $x = 0$? Is f' continuous at $x = 0$?

   Hint: One of the inequalities in page 104 is useful for part (b).

3. Section 3.6: Do as many problems as you can from problems 51, 53, $\cdots$, 77.

4. Assume $g(2) = 3$, $g'(2) = 0.1$, $f'(2) = 3$, $f'(3) = 4$ and $f'(4) = 5$. What is $\frac{d}{dx}f(g(x))$ at $x = 2$?

5. Section 3.7: problems 27, 31, 48, 51(a).