Homework Assignment 10 Due on Thursday 5/9

Do the following exercise problems in the text book by Salas, Hille and Etgen, Sec 7.1: 6, 14, 26, 32, 34, 49, 50, 52, 53 Sec 7.2: 4, 6, 14, 23 Sec 7.3: 4, 12, 14, 18, 22, 28, 30, 32, 34, 40, 43, 46, 47, 52, 66 Sec 7.4: 5, 16, 18, 24, 32, 36, 37, 42, 49, 51, 58

Do the following problems. Exercise 1. Let $f(x) = x^2 + 2x$.

- 1. Show that f(x) is not one-to-one on \mathbb{R} , but it is one-to-one on $(-\infty, -1]$.
- 2. SInce f(x) is one-to-one on $(-\infty, -1]$, find its inverse $f^{-1}(x)$.

Exercise 2. Show that for 0 < x, we have

$$\ln(1+x) > x - \frac{x^2}{2}$$

Exercise 3. FInd the derivative of $\ln(x + \sqrt{x^2 + 1})$. Use this result to find

$$\int_0^1 \frac{1}{\sqrt{1+x^2}} \, dx$$