

## Homework Assignment for Week 03

1. Read the details about ‘loglog’, ‘semilogx’, ‘semilogy’ in matlab/octave. Typical convergence behavior, such as  $y_n = C_1 n^{-k}$ , or  $z_n = C_2 \alpha^n$ , where  $n$  denotes the number of iterations and  $C_1 > 0$ ,  $C_2 > 0$ ,  $k > 0$  and  $0 < \alpha < 1$  are some constants, will have distinct behaviors when you choose the correct scaling. That is, if you try to plot  $y_n$  or  $z_n$  versus  $n$  in one of the special scalings above, you will see a straight line. Try to analyze it and find the rate of convergence of

$$\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{1}{i^2} = \frac{\pi^2}{6}$$

numerically by plotting the results in the correct scaling.

2. Section 2.2: Problems 2(b), 7, 12(a), 16, 24.
3. Section 2.3: Problems 16, 17(a,b), 19, 23(c).
4. Section 2.4: Problems 8, 9, 10, 12, 14.