Some review problems for Midterm

1. Review Homework 1, 2, 3. You can exclude the problems that involve Matlab.
2. Review all worksheets.
3. Do Problem 1 and 2 of Homework 4.
4. Consider the function $f(x) = \frac{\sin x}{x}$. Find a polynomial P such that

$$\max_{x \in [1,2]} |f(x) - P(x)| < 10^{-3}.$$

5. Consider the toy model of the IEEE double precision floating-point format as described in Homework 2. Put

$$\begin{aligned} x &= (1.011)_2 \times 2^1, \\ y &= (1.101)_2 \times 2^2, \\ z &= (1.001)_2 \times 2^3. \end{aligned}$$

Perform the following operations in this number format:

(a) $(x + y)z$

(b) $xz + yz$

Compare the two results. Explain your observation.