I. Calculate the three function in the interval $[0.99, 1.01]$.

We can see that each function have the values very close to zero in the interval $[0.99, 1.01]$, but their errors are different. I multiplied the values of each function by 10^{14} to magnify the scale. We can obviously found that the third
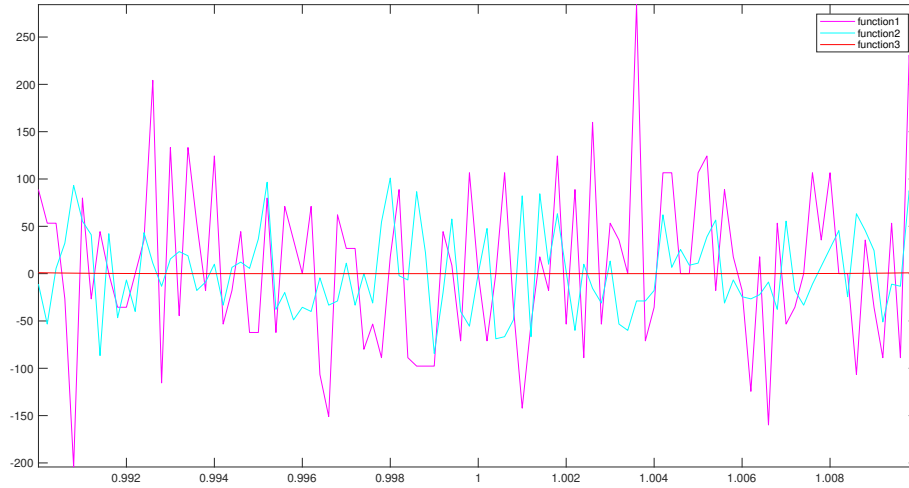

Figure 1: The values of each function multiplied by 10^{14}.

function is the most accurate , since it only use multiplication to calculate the result, which is accurate. While the other two functions both uses addition and it causes catastrophic cancellation as the result is close to 0.

II. Consider the normalized FPN system.
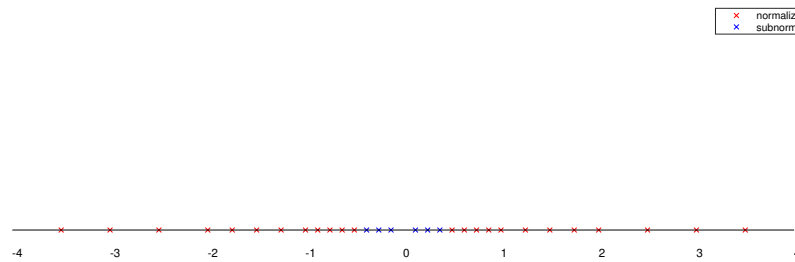
$UFL(\mathbb{F}) = 0.5, OFL(\mathbb{F}) = 3.5.$

Figure 2: The normalized and subnormal numbers of $\mathbb{F}$