Problem 1: for function $f(x)$, we know some values as

x_i	-1	0	1	2
$f(x_i)$	0	0	0	6

Find the Lagrange polynomial $L_3(x)$ and the Newton polynomial $N_3(x)$, write the error at point $\tilde{x}$.

Problem 2: we have known the data of $f(x) = \cos x$

x_i	$x_0 - h$	x_0	$x_0 + h$
$f(x_i)$	$f(x_0 - h)$	$f(x_0)$	$f(x_0 + h)$

If we use a $p_2(x)$ to interpolate $f(x)$, only if the step size h less than certain value h_0, the error will be smaller than 10^{-3}, can you decide the value h_0.

Problem 3: for following interpolating conditions, please find the polynomial satisfying them.

x_i	1	2	3
$f(x_i)$	2	4	12
$f'(x_i)$	1		

What is the error?