Assignment # 1

Question: A function $f(x) = e^x$ passes through the points $(0, 1)$, $(0.6, 1.8221)$ $1.2, 3.3201)$ and $(1.8, 6.0496)$ Answer the following Questions:

1. [1 point] If the function $f(x)$ is interpolated by a polynomial for $x \in [-0.5, 1.5]$ which points can be chosen as nodes?
2. [(2+2+2) points] Now, we would like to interpolate this function by a quadratic polynomial $p_2(x)$ by choosing the first three points as nodes. Compute the Lagrange basis for the interpolating function $p_2(x)$
3. [(1+2) points] Using the bases you found, write down the algebraic expression of $p_2(x)$ and simply the expression to write the result in natural basis.
4. [3 points] Verify that at the nodal points $|f(x) - p_2(x)| = 0$
5. [2 points] Compute the error $|f(0.75) - p_2(0.75)|$

Submission of the Assignment:

- Solve all the problems above.
- Prepare a title page including Your Name, Your ID#, Theory Section #.
- Prepare a single .pdf or .jpg file containing the tile page and the solution pages.

- To submit your assignment solution, visit the Submission Link (Click here). This will take you to a Google Form link.
- Fill up the Google Form link with correct information and upload the file there. You are done.

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