

Dept of Electronics and Communication Engineering, TKMCE Kollam

Scientific Computing Lab Aug-Dec 2020

Lab 4: Numerical Differentiation and Integration

Experiment:

1. Realize the functions $\sin t$, $\cos t$, $\sinh t$ and $\cosh t$ for the vector $t = [0, 10]$ with increment 0.01. Execute the program and upload the results.
2. Compute the first and second derivatives of above functions using built in tools such as `grad` and plot the derivatives. Execute the program and upload the results.
3. Realize the function $f(t) = 4t^2 + 3$ and plot it for the vector $t = [-5, 5]$ with increment 0.01. Execute the program and upload the results.
4. Use general integration tool to compute $\int_{-2}^2 f(t)dt$ where $f(t) = 4t^2 + 3$. Execute the program and upload the results.
5. Use general integration tool to compute $\int_0^{2\pi} f(t)dt$ where $f(t) = e^{-t}\sin(3t)$. Execute the program and upload the results.

Reports:

Preliminary Lab report:

1. Write a short note on different hyperbolic functions such as \sinh , \cosh , \tanh
2. Write the algorithm/ flowchart for the experiments listed in preceding section

Final Lab Report:

In addition to the Pre-lab report, document the code, comment each line and clearly report the results of each program (wherever applicable).