SC374-Computational and Numerical methods

Lab-* October 3, 2016

Please show all your work. Answers without supporting comments will not be given credit.

1. (a) Determine the piecewise quadratic of piecewise cubic interpolating polynomials for the function

$$f(x) = \frac{1}{\sqrt{1+x^2}}$$

with nodes at $-\frac{3}{2}, -1, -\frac{1}{2}, 0, \frac{1}{2}, \frac{3}{2}$.

(b) Obtain also a divided difference interpolating polynomial for the above data.

(c) Find the approximate value of $f(\frac{-1}{4})$ and by using the above obtained polynomials.

(d) Find the exact value of $\frac{-1}{4}$ and $\frac{3}{4}$.

(e) Compare the above three polynomials.

(f) Which one is giving more accurate result?