# Tutorial 2

1. ~~Suppose~~ let $x_0, x_1, \ldots, x_m$ be not necessarily distinct pts. Let $f$ and $g$ be two polynomials s.t $f$ and $g$ agree ~~upon~~ on $\underline{x} = x_0, x_1, \ldots, x_m$. Also $\deg f \leq m$ and $\deg g \leq m$. Show $f = g$

2. $f(0) = 1 \quad f'(0) = 0.5 \quad f''(0) = 2$

$f'''(0) = 3.$

Find a polynomial of degree $\leq 3$ which agrees with $f(x)$ at $0, 0, 0, 0$.

3. $f(0.2) = 1.823\ E{-}1$

$f'(0.2) = 8.333\ E{-}1$

$f(0.4) = 3.365\ E{-}1$

$f'(0.4) = 7.143\ E{-}1$

a) Construct the divided difference table

b) Approximate $f(0.3)$

(2)

4. A function $f(x)$ has a double zero at $z_1$ and a triple zero at $z_2$. Determine the form of the polynomial of degree $\leq 5$ which interpolates $f(x)$ twice at $z_1$, three times at $z_2$ and once at some other point $z_3$

(5)

$f(0.2) = 1.987\ E-1$

$f'(0.2) = 9.801\ E-1$

$f''(0.2) = -1.987\ E-1$

$f(0.3) = 3.894\ E-1$

Construct the divided difference table and approximate $f(0.3)$