$$\frac{x}{0.1}$$
  $\frac{f(x)}{0.990}$ 

## 0.1

## a) Lagrange interpolation

$$P_{n}(x) = \sum_{j=0}^{n} \frac{1}{j} \frac{(2z-2i)}{(2j-2i)} y_{j}$$

$$i \neq j$$

for oth order

We will give preference to the points near our given a

$$x_i$$
  $f(x_i)$   $|x-x_i|$  ;  $x=0.275$ 

0.1 0.990 0.175

0.2 0.961 0.075

0.3 0.917 0.025

0.4 0.862 0.125

0.5 0.900 0.225

0.800

Rearrange in ascending order of 12-21)

1	2i	f(ai)
0	0.3	0.917
1	0.2	0.961
2	0.4	0.862
3	0.1	6.990
1.0		

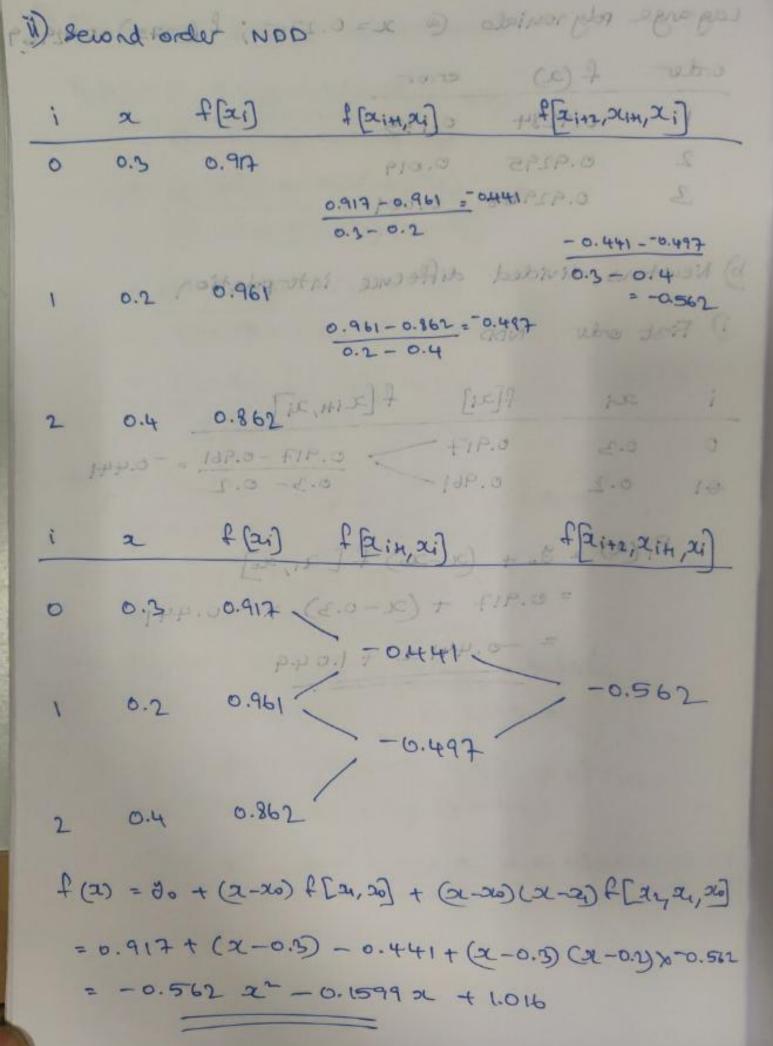
0.5

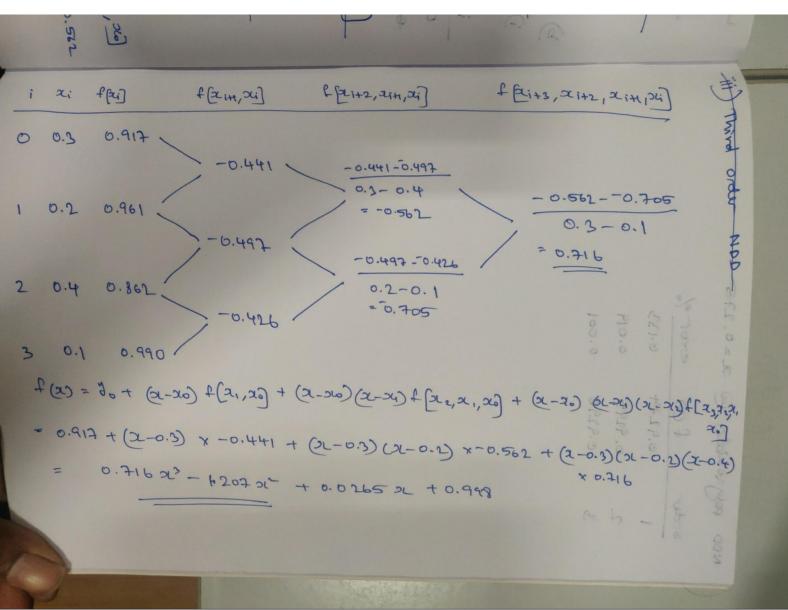
1) that order radicable intropolation and the part (1)  $P_{1}(2) = (2x - 2x) \times 30 + (2x - 2x0) \times 31, 31 = (2x_{1} - 2x_{0})$ = (2-0.2) x 0.917 + (2-0.3) 0.9615 (0.3-0.2) -0.4412 ct 1.0498 (1.04) ii) second order Lagrange interpolation P2(2) = (2-2) (2-22) × 80 + (2-20) (2-22) × 8, (20-21) (20-21) (21,-20) (21,-20) + (2-20) (21-21) × 720-50 (00-30) FIF (22-20) (22-20) = (2-0.2) (2-0.4) x 0.917 (0.3-0.2) (0.3-0.4) (p.0-5.0) (8.0-5.9) + (2-0.3) (2-0.4) x 0.9615 (0.2-0.3) (0.2-0.4) + (x-0.3)(x-0.2) x 0.862 (0.4-0.3) (0.4-0.2) (p. 0 10) (s.0-10) (s.0-10) = -0.5622-0.1592 + 1.016

(ii) Third order Lagrange Meterpolation of the Cili P3(a) = (a-21) (a-22) (a-23) x yo (a,-21) (20-22) (20-23) + (a-20)(a-20) (x y, (2,-20) (21,-22) (21-213) + (2-20) (2-20) (2-20) × 00 (x2-x0) (22-x1) (22-23) + (x-xo) (21-x1) (x-22) x y3
(23-20) (23-21) (223-21) = (x-0.2) (2-0.4) (x-0.1) x 0.917 (0.3-0.2) (0.3-0.4) (0.3-0.1) + (2-0.3)(2-0.4)(2-0.0) x0.961 (0.2-0.3) (0.2-0.4) (0.2-0.1) + (x-0.3)(x-0.2) (x-0.0) x 6.8621 (0.4-0.3) (0.4-0.2) (0.4-0.1) + (x-0.3) (x-0.2) (x-0.4) x0,990 (0.1-0.3) (0.1-0.2) (a1-0.4) 0.716 23 - 0. + 1.207 x2 + 0.0265x +0.998

Lagrange poly nomials @ 21 = 0.275; f (0.275) = 0.92969 order f (a) eror (1x)7 112 019284 0.1335) AP.0 8.0 0.9295 0.019 0.92968 0.001 FIPS 5.0-1.0 184.5- 144.0-6) Newtons divided difference interpolation i) First order NDD - 188.0 f[zi] f[zin, zi] ai 0.3 0 0.961 0.3-0.2 0.2 10 P, (a) 2 8. + (21-26) + [21,26] = 0.917 + (x-0.3) x -0.441 -0.4412 + 1.049 128.0 5.0 (38.0-FPH.O-· (38.0 ph) ( (x-x) + (x-x) (xx-x) + (x-xx) (xx-x) + 06 = (x) + 12.5 K(15-50 (6.0 x) + 1+4.0 - (6.0-x) + FIF.0 = HOJ & JEPERO - TE STERT E

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NDD ter fas 2=0.275 order eror % 0.9284 6.133 0.9296 0.9295 2 3 0.019 0.001 (25-20) + (25,25) + (25-30) 530.0-X (4-0