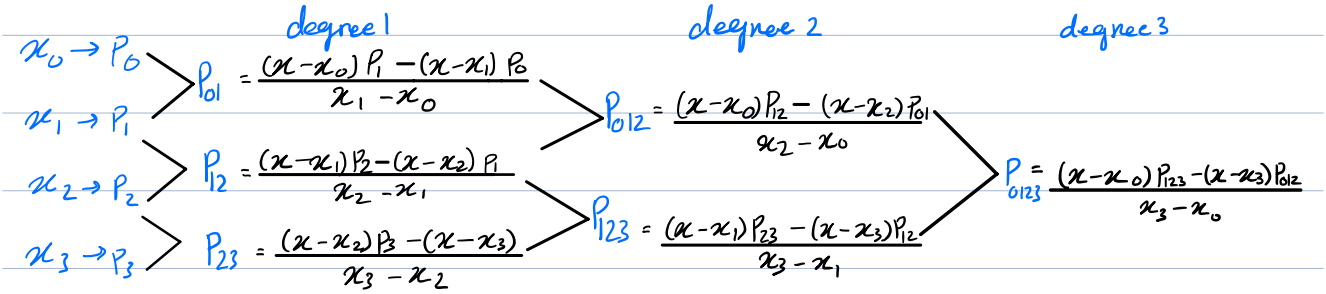
Neville's

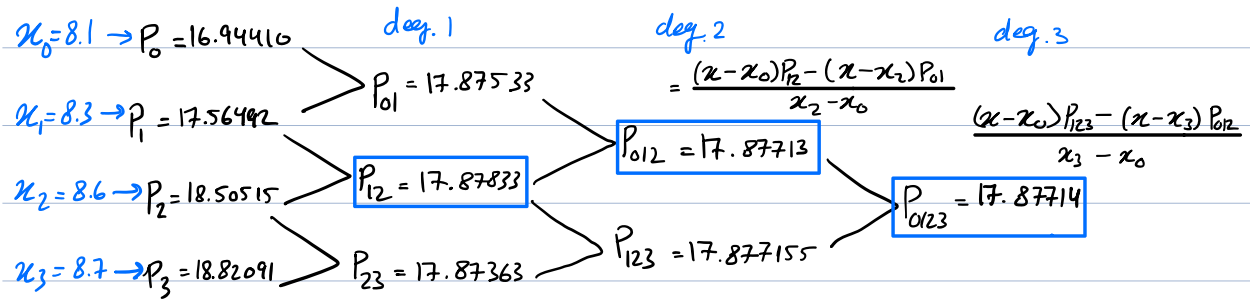


Q1 c

1. Use Neville's method to obtain the approximations for Lagrange interpolating polynomials of degrees one, two, and three to approximate each of the following:

   a. $f(8.4)$ if $f(8.1) = 16.94410$, $f(8.3) = 17.56492$, $f(8.6) = 18.50515$, $f(8.7) = 18.82091$

$x \Rightarrow 8.4$



for degree 1 $\Rightarrow$ we need to choose the P that $x = 8.4$ close/between it's x's

for degree 2,3 $\Rightarrow$ we choose what is similare to deg 1

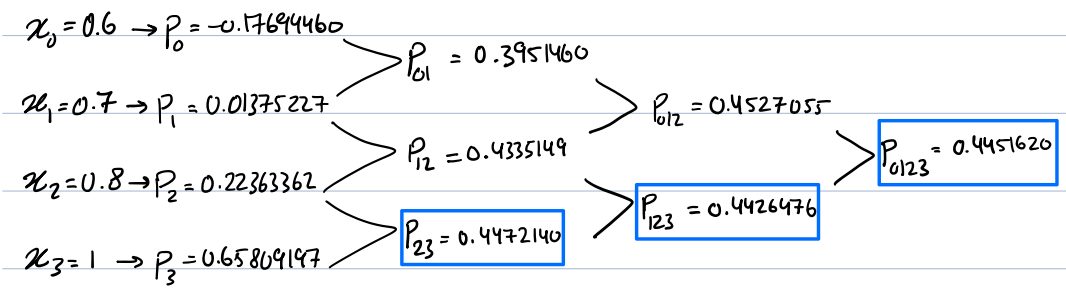
$$P_{01} = \frac{(8.4 - 8.1)(17.56492) - (8.4 - 8.3)(16.94410)}{8.3 - 8.1} = 17.87533$$

and P_{12} , P_{23} is the same

Q18

d. $f(0.9)$ if $f(0.6) = -0.17694460$, $f(0.7) = 0.01375227$, $f(0.8) = 0.22363362$, $f(1.0) = 0.65809197$

$x \Rightarrow 0.9$



Q38

Q5? find a missing parts in Neville's method's

5. Neville's method is used to approximate $f(0.4)$, giving the following table.

$x_0 = 0$	$P_0 = 1$			
$x_1 = 0.25$	$P_1 = 2$	$P_{01} = 2.6$		
$x_2 = 0.5$	P_2 ?	$P_{1,2}$?	$P_{0,1,2}$ = ?	
$x_3 = 0.75$	$P_3 = 8$	$P_{2,3} = 2.4$	$P_{1,2,3} = 2.96$	$P_{0,1,2,3} = 3.016$

Determine $P_2 = f(0.5)$.

$$P_{0123} = \frac{(x - x_0)P_{123} - (x - x_3)P_{012}}{x_3 - x_0}$$

$$3.016 = \frac{(0.4 - 0)\,2.96 - (0.4 - 0.75)\,P_{012}}{0.75 - 0}$$

$$3.016 = \frac{1.184 - (-0.35)\,P_{012}}{0.75}$$

$$0.75 \times 3.016 = 1.184 - (-0.35)\,P_{012}$$

$$\frac{2.262 - 1.184}{0.35} = \frac{0.35}{0.35} P_{012}$$

$$\frac{3.016(0.75)}{1.534} = \frac{(1.534)\,P_{012}}{1.534}$$

$$P_{012} = 1.4745762$$

$$P_{012} = \frac{1.078}{0.35}$$

$$\boxed{P_{012} = 3.08}$$

$$P_{012} = \frac{(x-x_0)P_{12} - (x-x_2)P_{01}}{x_2 - x_0}$$

$$3.08 = \frac{(0.4-0)P_{12} - (0.4-0.5)2.6}{0.5-0}$$

$$0.5 \times 3.08 = \frac{(0.4)P_{12} + 0.26}{0.5} \times 0.5$$

$$1.54 = (0.4)P_{12} + 0.26$$

$$\frac{1.28}{0.4} = \frac{0.4}{0.4} P_{12}$$

$$\boxed{P_{12} = 3.2}$$

$$P_{12} = \frac{(x-x_1)P_2 - (x-x_2)P}{x_2 - x_1}$$

$$3.2 = \frac{(0.4-0.25)P_2 - (0.4-0.5)2}{0.5-0.25}$$

$$0.25 \times 3.2 = \frac{(0.15)P_2 + 0.2}{0.25} \times 0.25$$

$$0.8 = (0.15)P_2 + 0.2$$

$$\frac{0.6}{0.15} = \frac{0.15}{0.15} P_2$$

$$\boxed{P_2 = 4}$$

Q7