Lagrange interpolation. Classical and Newton forms

A

1. Construct the polynomial that interpolates the data below and approximate $f(-1)$.

x	-2	0	1
$f(x)$	1	4	5

2. Using Newton's form, obtain the polynomial that interpolates the following data:

x	-2	-1	0	1	2
$f(x)$	2	14	4	2	2

3. What is the error when approximating $\sqrt{140}$ using Lagrange interpolation for the function $f(x) = \sqrt{x}$ and the nodes $x_0 = 100,\ x_1 = 121,\ x_2 = 144$?

4. Approximate $\sqrt{8}$ using 3 nodes and the Newton interpolation polynomial.

B

1. Construct the polynomial that interpolates the data below and approximate $f(2)$.

x	0	1	3
$f(x)$	4	5	15

2. Using Newton's form, obtain the polynomial that interpolates the following data:

x	-2	-1	0	1	2	3
$f(x)$	1	4	11	16	13	-4

3. What is the error when approximating $\sqrt{120}$ using Lagrange interpolation for the function $f(x) = \sqrt{x}$ and the nodes $x_0 = 100,\ x_1 = 121,\ x_2 = 144$?

4. Approximate $\sqrt{3}$ using 3 nodes and the Newton interpolation polynomial.