chapter 2: 2.9.2 Programming assignments

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1 B

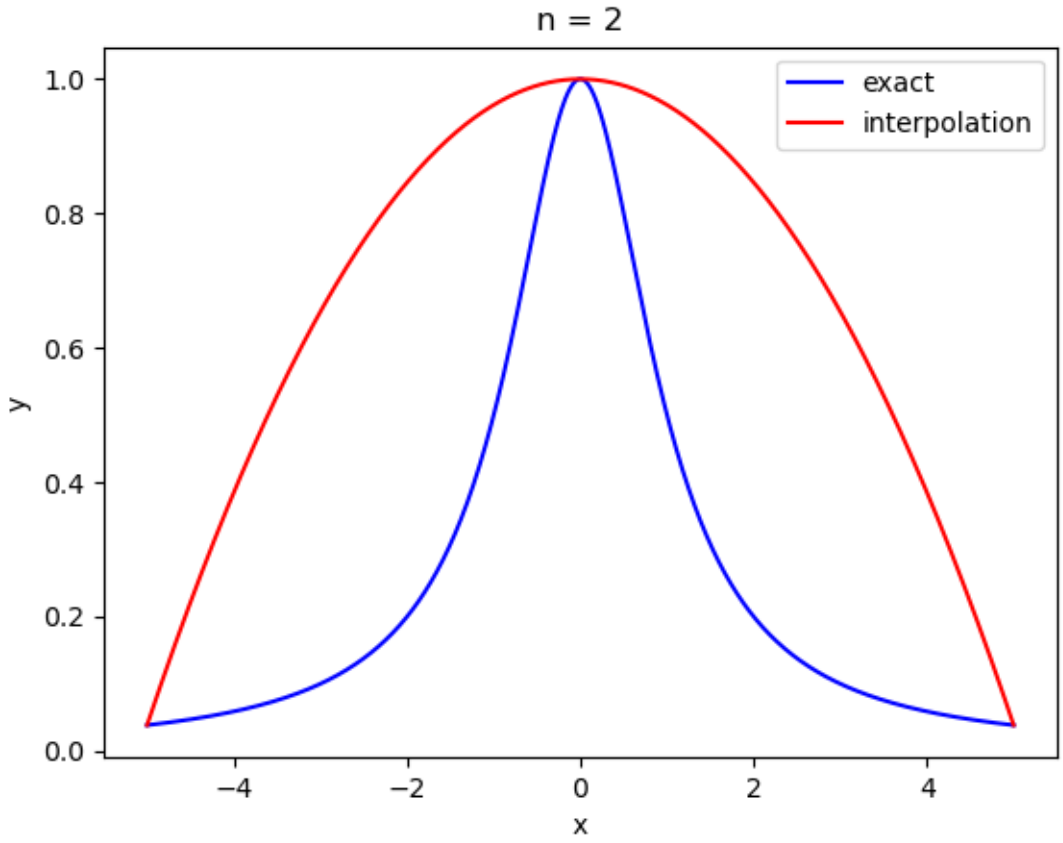


Figure 1: n=2

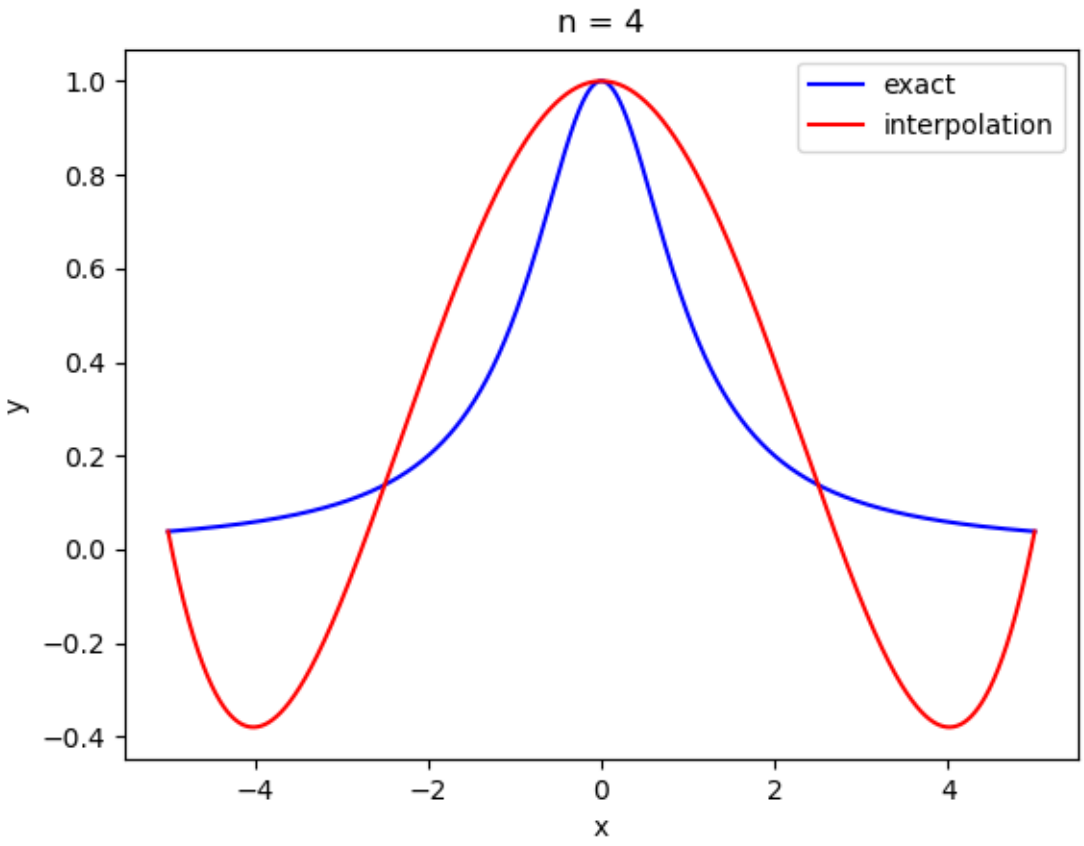


Figure 2: n=4

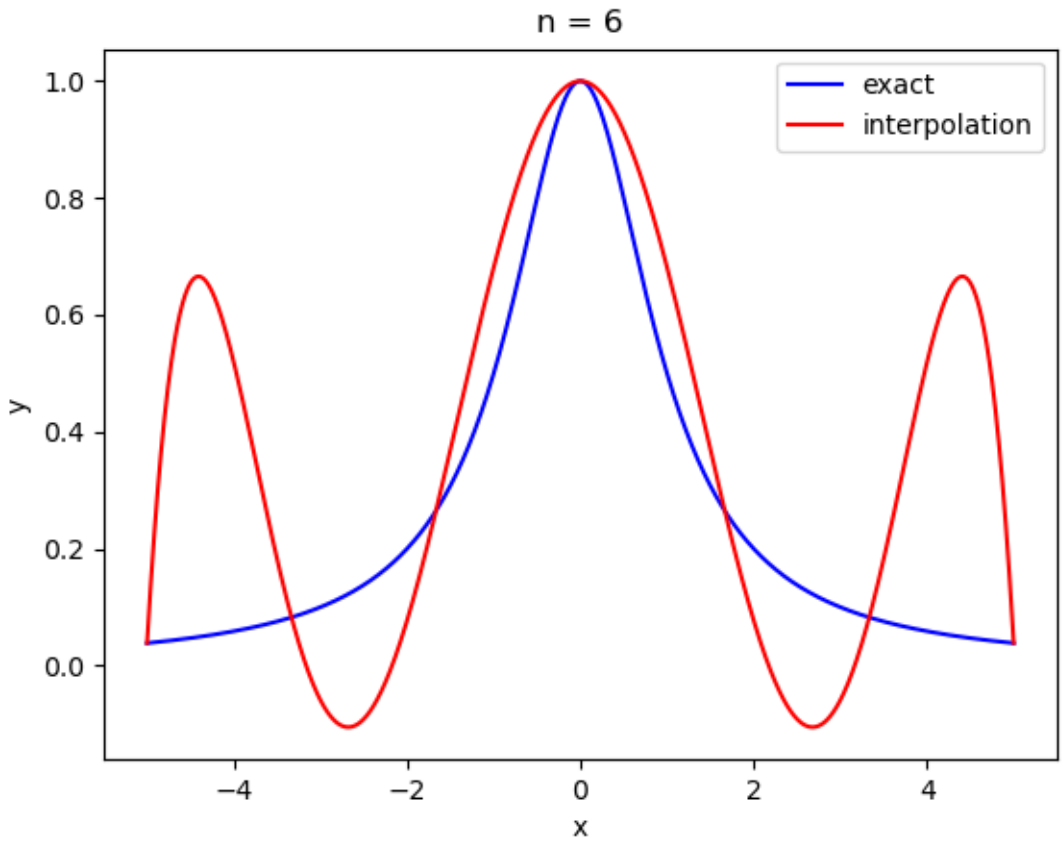


Figure 3: n=6

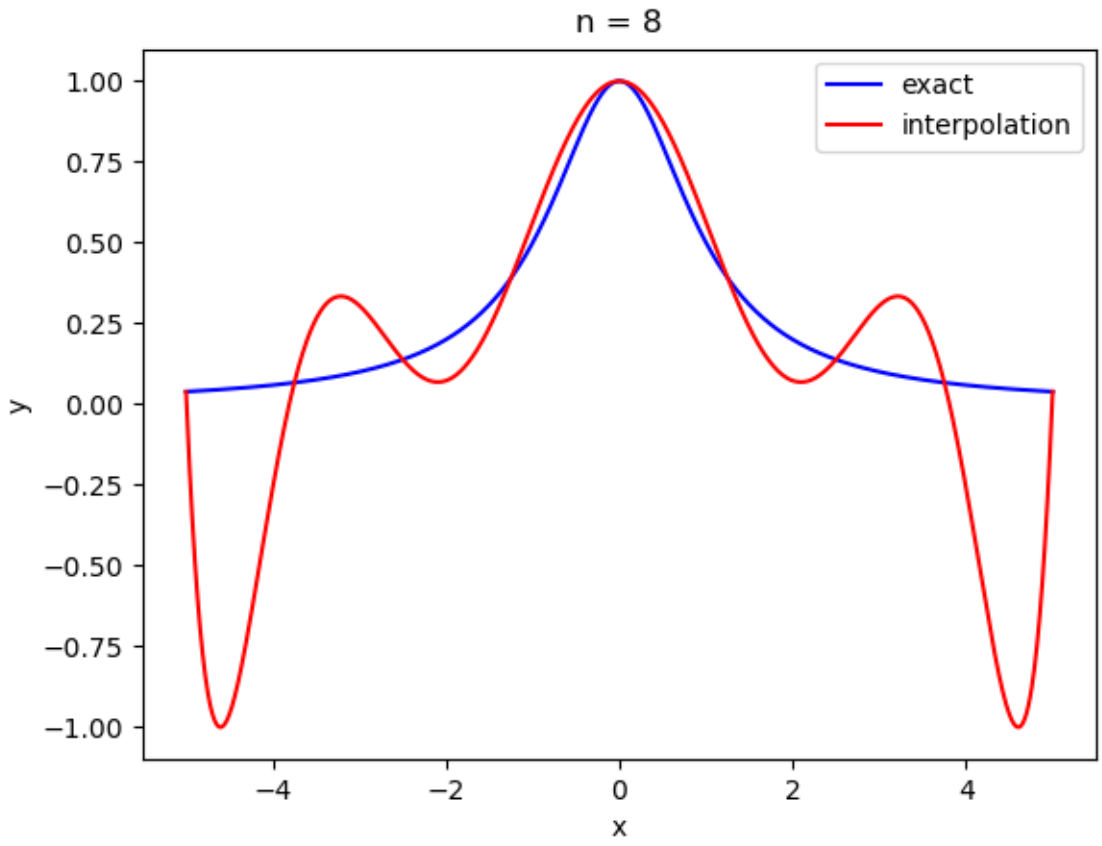

n = 8
exact
interpolation
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00
y
−4
−2
0
2
4
x

Figure 4: n=8

2 C

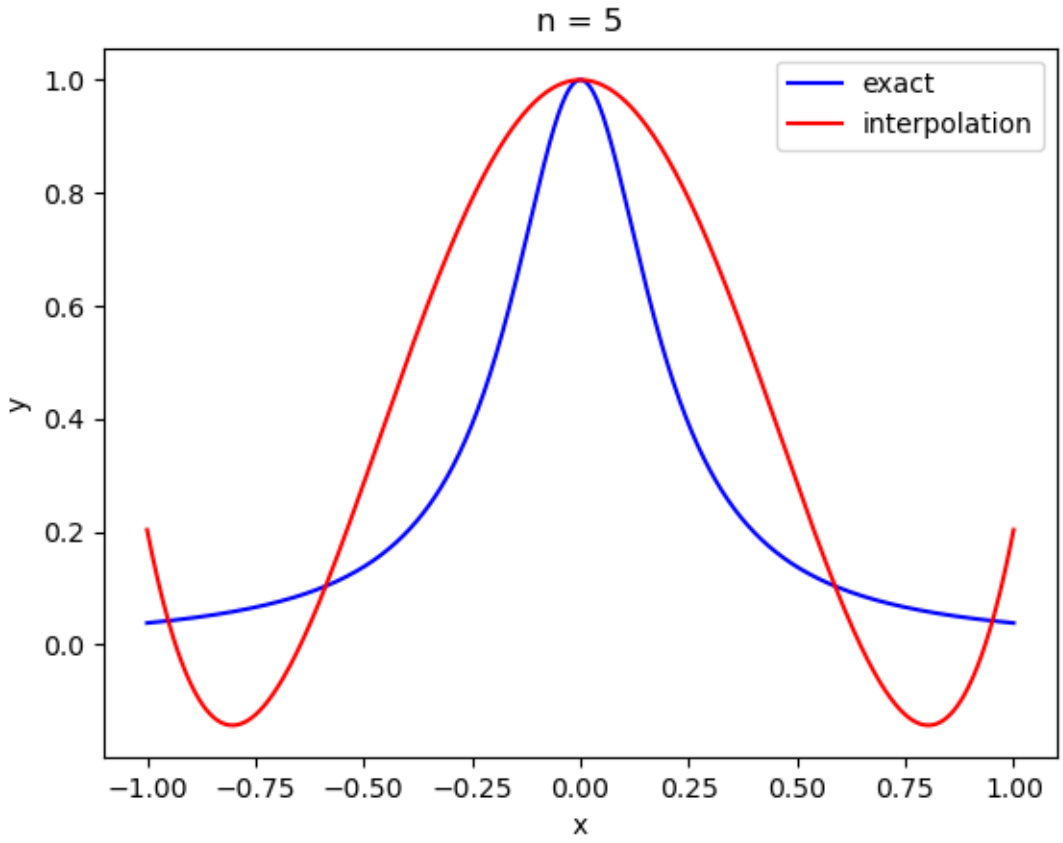


Figure 5: n=5

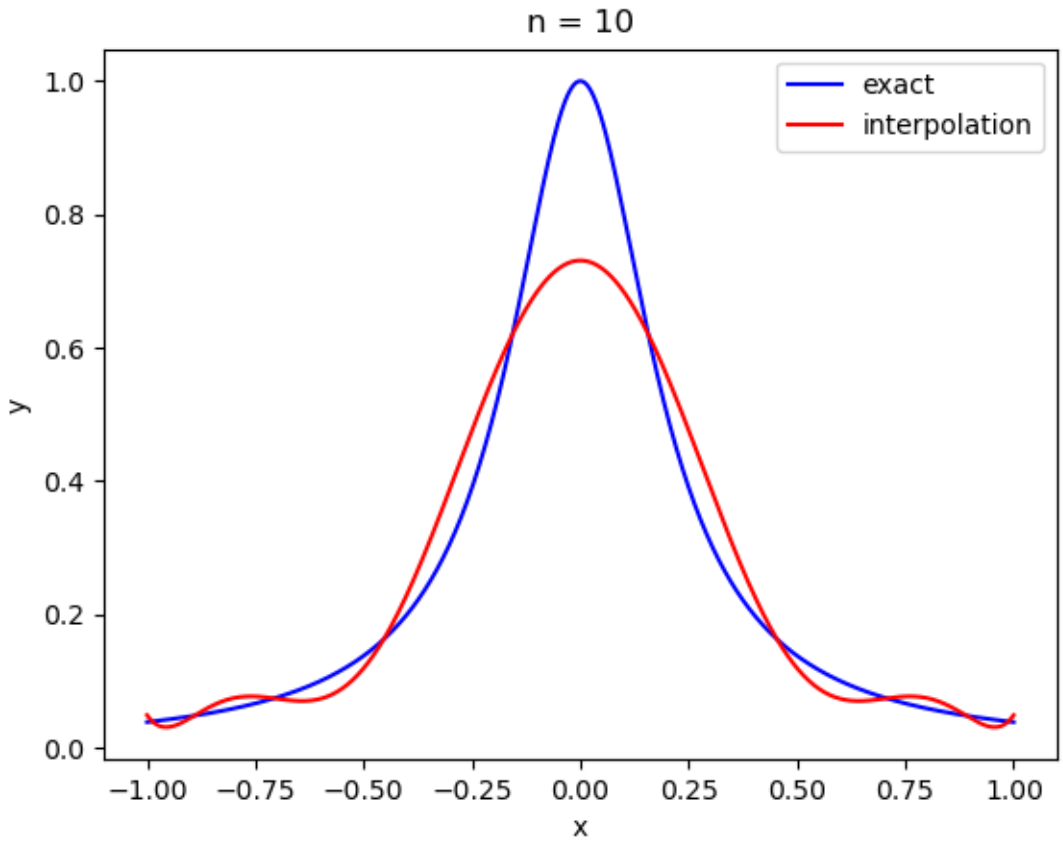
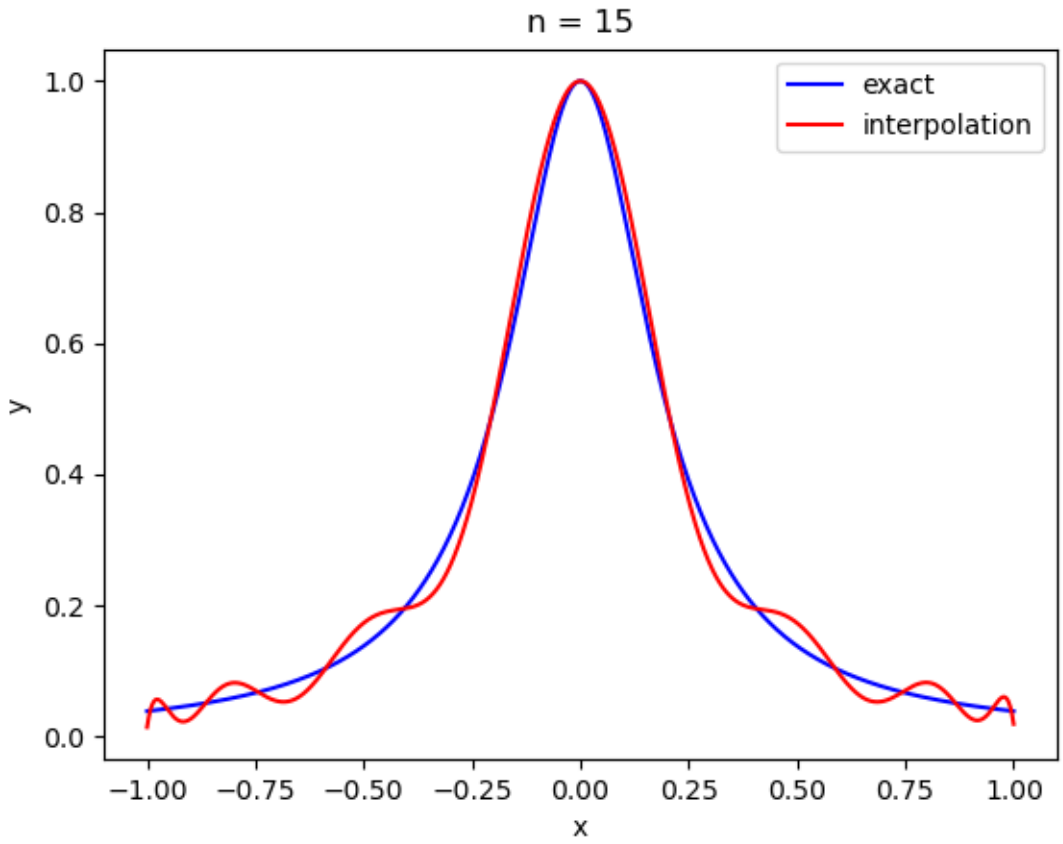

n = 10
exact
interpolation
1.0
0.8
0.6
0.4
0.2
0.0
y
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
x

Figure 6: n=10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interpolation
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0.8
0.6
0.4
0.2
0.0
y
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
x

Figure 7: n=15

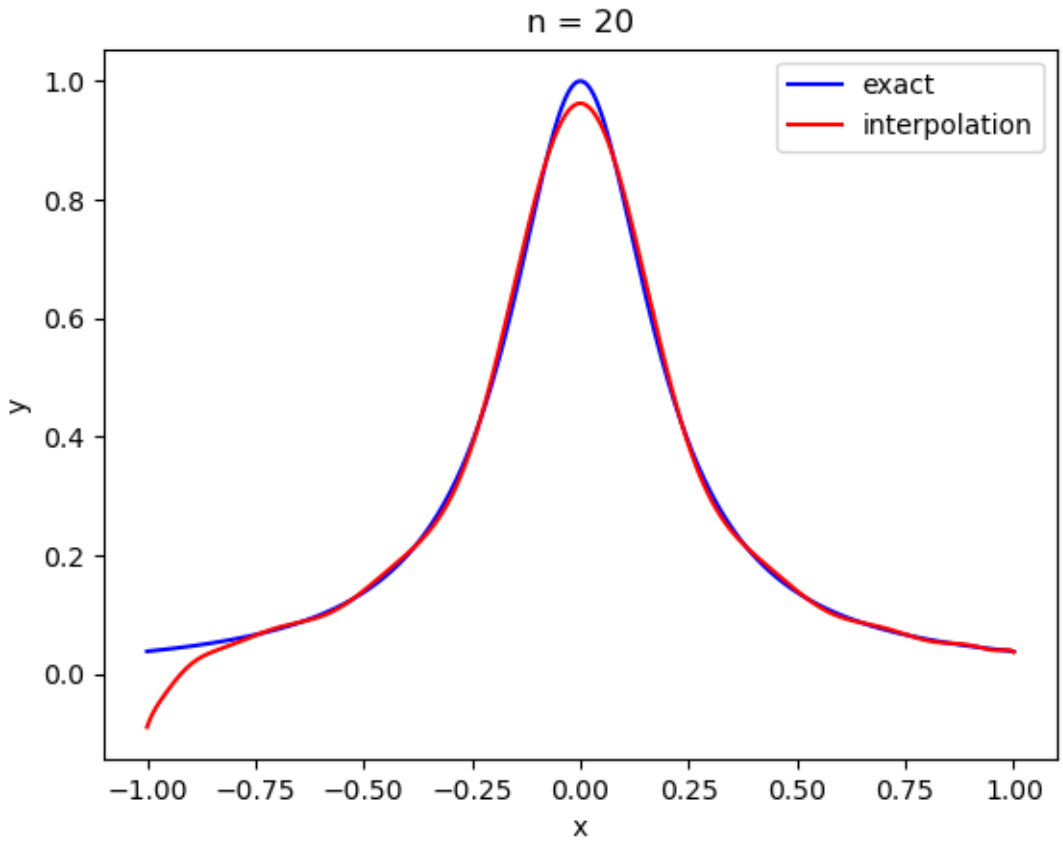

Figure 8: n=20

3 D

3.1 (a)

The velocity of the car at t=10 is 48.3775 m/s.

3.2 (b)

The car's speed exceeds 81 m/s between t = 5.92092 and t = 6.94895
The car's speed exceeds 81 m/s between t = 11.3734 and t = 12.9479

4 E

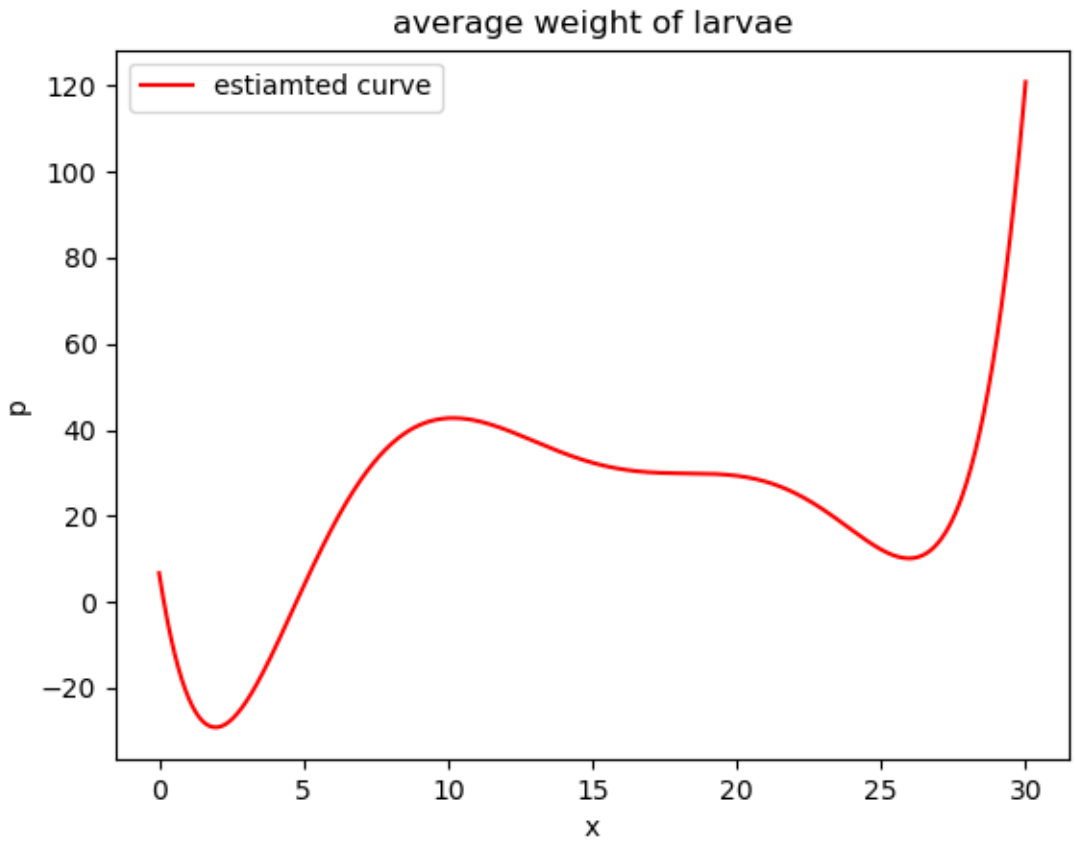

Figure 9: young tree

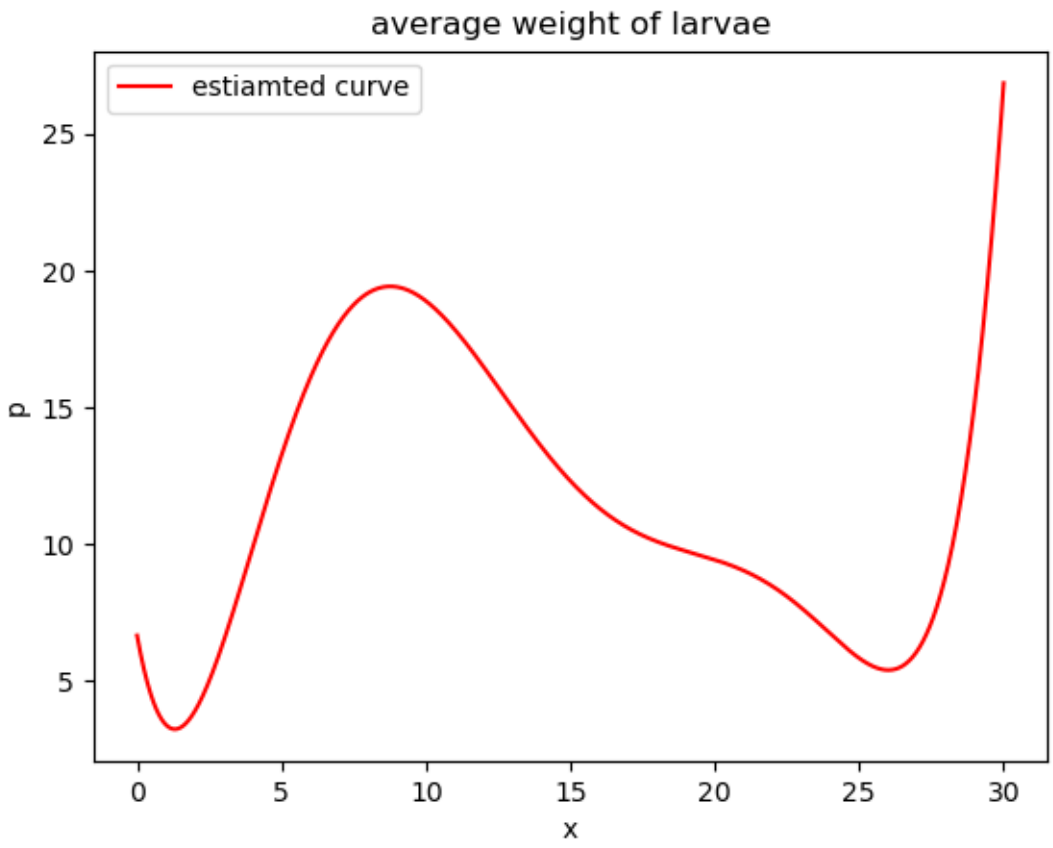

Figure 10: old tree

As we can see from the graphs the weight of larvae exploded because of the Runge phenomenon, so we can't accurately predict the weight of larvae in the future.