

1

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Degree=1 :

Result = 0.7320771

Error bound = 0.0004420

Absolute error = 0.0003771

Relative error = 0.0515434%

Degree=2 :

Result = 0.7317163

Error bound = 0.0000027

Absolute error = 0.0000163

Relative error = 0.0022313%

Degree=3 :

Result = 0.7317040

Error bound = 0.0000000

Absolute error = 0.0000040

Relative error = 0.0005406%

Degree=4 :

Result = 0.7317000

Error bound = 0.0000000

Absolute error = 0.0000000

Relative error = 0.0000000%

1th Lagrange interpolation polynomial :

Points used :

(0.698, 0.7661)

(0.733, 0.7432)

Result = 0.7320771

Error bound = 0.0004420

Absolute error = 0.0003771

Relative error = 0.0515434%

2th Lagrange interpolation polynomial :

Points used :

(0.698, 0.7661)

(0.733, 0.7432)

(0.768, 0.7193)

Result = 0.7317163

Error bound = 0.0000027

Absolute error = 0.0000163

Relative error = 0.0022313%

3th Lagrange interpolation polynomial :

Points used :

(0.698, 0.7661)

(0.733, 0.7432)

(0.768, 0.7193)

(0.803, 0.6946)

Result = 0.7317040

Error bound = 0.0000000

Absolute error = 0.0000040

Relative error = 0.0005406%

4th Lagrange interpolation polynomial :

Points used :

(0.698, 0.7661)

(0.733, 0.7432)

(0.768, 0.7193)

(0.803, 0.6946)

(0.750, 0.7317)

Result = 0.7317000

Error bound = 0.0000000

Absolute error = 0.0000000

Relative error = 0.0000000%

2

$x=0.567143$

```
Iteration 1: x = 1.491825, f(x) = -1.891825
Iteration 2: x = 0.224962, f(x) = 1.266863
Iteration 3: x = 0.798547, f(x) = -0.573585
Iteration 4: x = 0.449982, f(x) = 0.348564
Iteration 5: x = 0.637639, f(x) = -0.187657
Iteration 6: x = 0.528539, f(x) = 0.109101
Iteration 7: x = 0.589466, f(x) = -0.060927
Iteration 8: x = 0.554624, f(x) = 0.034842
Iteration 9: x = 0.574288, f(x) = -0.019665
Iteration 10: x = 0.563105, f(x) = 0.011183
Iteration 11: x = 0.569438, f(x) = -0.006333
Iteration 12: x = 0.565843, f(x) = 0.003595
Iteration 13: x = 0.567881, f(x) = -0.002038
Iteration 14: x = 0.566725, f(x) = 0.001156
Iteration 15: x = 0.567381, f(x) = -0.000655
Iteration 16: x = 0.567009, f(x) = 0.000372
Iteration 17: x = 0.567220, f(x) = -0.000211
Iteration 18: x = 0.567100, f(x) = 0.000120
Iteration 19: x = 0.567168, f(x) = -0.000068
Iteration 20: x = 0.567129, f(x) = 0.000038
Iteration 21: x = 0.567151, f(x) = -0.000022
Iteration 22: x = 0.567139, f(x) = 0.000012
Iteration 23: x = 0.567146, f(x) = -0.000007
Iteration 24: x = 0.567142, f(x) = 0.000004
Iteration 25: x = 0.567144, f(x) = -0.000002
Iteration 26: x = 0.567143, f(x) = 0.000001
Converged to solution: x = 0.567143
```

3

a. At $t = 10\text{s}$:

Position = 768.96 ft

Velocity = 74.64 ft/s

b. The car did exceed the speed limit.

First time exceeding speed limit at 3.15 seconds

c. The predicted maximum speed is 92.04 ft/s

```
a. At t = 10s:  
  Position = 768.96 ft  
  Velocity = 74.64 ft/s  
  
b. The car did exceed the speed limit.  
  First time exceeding speed limit at 3.15 seconds  
  
c. The predicted maximum speed is 92.04 ft/s
```

