

(1)

degree one result: 0.7320771428571429

error bound: 0.00044200000000000077

degree two result: 0.7317163265306121

error bound: 2.652000000000007e-06

degree three result: 0.7317039556851311

error bound: 3.51390000000013e-08

It is not possible to obtain the solution for the degree-four interpolation because the problem provides only four reference points, whereas five are required for its implementation.

(2)

The 1 time(s) iteration:

p1 = 0.44999999999999996

The 2 time(s) iteration:

p2 = 0.5249999999999999

The 3 time(s) iteration:

p3 = 0.5625

The 4 time(s) iteration:

p4 = 0.58125

The 5 time(s) iteration:

p5 = 0.571875

The 6 time(s) iteration:

p6 = 0.5671875

The 7 time(s) iteration:

p7 = 0.56484375

The 8 time(s) iteration:

p8 = 0.5660156249999999

The 9 time(s) iteration:

p9 = 0.5660156249999999

The 10 time(s) iteration:

p10 = 0.56689453125

The approximate root is: 0.56689453125

(3)

Predicted position at $t=10$: 768.96 feet

Predicted speed at $t=10$: 74.64 ft/s (50.89 mi/h)

First time car exceeds 55 mi/h: 3.15 s

Predicted maximum speed: 84.32 ft/s (57.49 mi/h)