(1)
degree one result: 0.7320771428571429
  error: 0.05154337257658243 %

degree two result: 0.7317163265306121
  error: 0.002231314830138137 %

degree three result: 0.7317039556851311
  error: 0.000540615707409927 %

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 = 0.5666015624999999
The 10 time(s) iteration:
p10 = 0.56689453125
The approximate root is: 0.56689453125

(3)
when t = 10 s, position = 596.3160062016384 (ft).
when t = 10 s, velocity = -100.71764102690393 (ft/s).
The car can exceed 55 mi/h, when t = 0.033 (s).
predicted maximum speed: 398.2041183121509 (ft/s).