Quiz (IV)

Finished by 18:00 on 5/24

a. Create a matlab script F7xxxxxxx_quiz4.m and link all the programs to this script.
b. Make sure once type the filename' F7xxxxxxx_quiz4', the root must be shown with appropriate significant digits. The example output is:
   " Prob 1: The root is x.xxxxxxx"
   " Prob 2: The root is x.xxxxx…"
   " Prob 3: The shooting angle should be x.xxxx… degree"
c. Answer all the questions including the root found with required explanation in 'F7xxxxxxx_quiz4.txt'.
d. Remember not to type any 'clear all' or 'close all' command in any of the codes.

1. [F7xxxxxxx_quiz4_prob1.m]
   Find a root of $2.1x^2 - e^x = 0$
   (a) Which method do you use to solve the problem?
   (b) Within which interval do you expect to find a root?
   (c) What is the initial number or initial interval chosen to start the solver?
   (d) How many times of iteration does the algorithm require to find the solution with 8 significant digits? And what is the answer?
   (e) Is the root found in the expected interval? If no, why?

2. [F7xxxxxxx_quiz4_prob2.m]
   Use the Newton's Method or the Secant Method to find the smallest positive root of $x + 3cosx = 0$
   (a) Which method do you use to solve the problem?
   (b) Within which interval do you expect to find the root?
   (c) What is the initial number chosen to start the solver?
   (d) How many times of iteration does the algorithm require to find the solution with 8 significant digits? And what is the answer?
   (e) Is the root found in the expected interval? If no, why?

3. [F7xxxxxxx_quiz4_prob3.m]
   Suppose you are aiming for a 3 pointer launched 6.5m away from the basket. Usually the basketball is released at a speed of 8.7m/s from 2.3m high.
   (a) Type down the equation(s) for solving the shooting angle.
   (b) What angle should you aim to score?
   Note that the basket is 3.05m high, the hoop is 45 cm in diameter and the basketball is 23.5cm in diameter.

========== BONUS==========

4. [F7xxxxxxx_quiz4_prob4.m]
   Find all the roots of $x^5 - 1.2x^4 - 19.85x^3 + 4.056x^2 + 0.994x - 0.12 = 0$
   (a) What are the roots?
   (b) Explain how you find them?