Quiz #3 Solution

Question # 1

Question # 1

1 point possible (graded)

Question # 1: Function, $f(x)$, is non-linear if the degree of $f(x)$ is

- greater than or equal to 1.
- equal to 1.
- greater than 1. Ans
- None of the above .

You have used 0 of 1 attempt

Question # 2

Question # 2

1 point possible (graded)

Question # 2: If putting $x = x_a$ in $f(x)$ gives 0, then which of the following statements is correct?

- x_a is called the STAR of the function.
- x_a is the x-intercept of $f(x)$. Ans
- $(x + x_a)$ is one of the factors of $f(x)$.
- None of the above.

You have used 0 of 1 attempt

Question # 3

Question # 3

1 point possible (graded)

Question # 3: Consider an interval $[a, b]$ for a function $f(x)$. Now $f(a) > 0$ and $f(b) > 0$. What will we do in the case of the interval bisection method?

- We will start finding points randomly in the interval and see if they yield zero.
- We will discard the interval and conclude that there is no solution to this function. Ans.

- We will find turning points that lie in the given interval and start working with those.
- We will find the midpoint of a and b and continue running the algorithm.

You have used 0 of 1 attempt

Question # 4

Question # 4

1 point possible (graded)

Question # 4: In the interval bisection method, if we decrease the error bound, then the number of iterations to find the solution

- Remains the same.
- Decrease.
- Increase. Ans !
- None of the above.

You have used 0 of 1 attempt

Question# 5

Question# 5

1 point possible (graded)

Question # 5: Consider the following function, $f(x) = x^2 - 5x + 6$ in the interval $[2.5, 6]$. For the interval bisection method, what will be the midpoint for the second iteration? Consider that the first iteration starts with the extreme points of the given interval.

- $3.375.$ Ans
- $0.515.$
- $5.125.$
- $4.25.$

You have used 0 of 1 attempt

Question # 6

Question # 6

1 point possible (graded)

Question # 6: Consider the following function, $f(x) = x^2 - 5x + 6$ in the interval $[0, 2.5]$ and error bound $\delta = 0.00001$. Find the minimum number of iterations to find the root in interval bisection method.

- 20.
- 18.
- 19.
- 17. Ans

You have used 0 of 1 attempt

Question #7

Question #7

1 point possible (graded)

Question # 7: Consider the following function, $f(x) = x^4 - x - 10$, with $g(x) = x^4 - 10$. Starting with the initial point $x = 2$, $g(x)$ is

- superlinearly converging.
- diverging. Ans:
- sublinearly converging.
- linearly convergin.

You have used 0 of 1 attempt

Question # 8

Question # 8

1 point possible (graded)

Question # 8: Consider for the following function, $f(x) = x^4 - x - 10$, and $g(x) = \dfrac{10}{x^3 - 1}$. Starting with the initial point $x = 2$, $g(x)$ is

- linearly converging.
- in the infinite loop. Ans:
- superlinearly converging.

diverging.

You have used 0 of 1 attempt

Question # 9

Question # 9

1 point possible (graded)

Question # 9: Imagine you have a function $f(x)$ with roots 1 and 5 and one of its fixed point representations is $g(x)$. For both 1 and 5, $g(x)$ is converging. Now if initially we start from 100, which fixed point shall it converge to?

- 1.
- 5 and 1 simultaneously.
- $\boxed{5.}$ Ans
- First 5, then 1.

You have used 0 of 1 attempt

Question # 10

Question # 10

1 point possible (graded)

Question # 10: Imagine you have a function $f(x)$ with roots 1 and 5 and one of its fixed point representations is $g(x)$. For 1, $\lambda < 1$ and for 5, $\lambda > 1$. Now if initially we start from 100, which fixed point shall we converge to?

- $\boxed{1.}$ ✓
- 5 and 1 simultaneously.
- 5.
- First 5, then 1.

You have used 0 of 1 attempt

Question # 11

Question # 11

1 point possible (graded)

Question # 11: Newton's method fails at the

- Steep points.
- Turning points. Ans:
- Downward going points.
- Touching points.

You have used 0 of 1 attempt

Question # 12

Question # 12

1 point possible (graded)

Question # 12: Secant method is also known as

- Inverse cosecant function.
- Quasi Tangent method.
- Quasi Newton method. Ans
- Newton method.

You have used 0 of 1 attempt

Question # 13

Question # 13

1 point possible (graded)

Question # 13: Consider the sequence of points $x_1, x_2, x_3, x_4, x_5, x_6, \cdots$. We will apply Aitken's acceleration

- $x_3, x_5, x_7, \cdots$. Ans:
- Only x_3.
- $x_2, x_4, x_6, \cdots$.
- Only x_2.

You have used 0 of 1 attempt

Question # 14

Question # 14

1 point possible (graded)

Question # 14: We can apply Aitken's acceleration to

- ◯ Secant method.
- ◯ Newton's method. Ans
- ◯ Both of the above.
- ◯ None of the above.

You have used 0 of 1 attempt

Question # 15

Question # 15

1 point possible (graded)

Question # 15: Number of starting points needed in Secant method is

- ◯ 4.
- ◯ 2. Ans
- ◯ 3.
- ◯ 1.