2 July 2018 individual task in calculus:

Edited at 8am 2 July 2018.

s is your student number. k = s mod 10000. T = s mod 100. m = s mod 35. a = s mod 25.

L = s mod 10. . e = s mod 8. m7 = s mod 7. m6 = s mod 6. m5 = s mod 5. m4 = s mod 4.

m3 = s mod 3. m2 = s mod 2. u = s + 10000.

1. Solve y´ = y/T, y(0) = 1/k using m2 + 2 unitary steps. Calculate error.

2. Heaviside method:

L1 = L

m1 = m

n1 = s

a1 = a

b1 = T

c1 = e

3. Determine the type of the partial differential equation.

m2 = 0: -6Hxx + 7Hxt – 5Htt +675Hx – 34Ht + 54356 = 0

m2 = 1: 39Hxx + 23Hxt – 305Htt - 6567Hx +56465Ht - 67467 = 0

4. Calculate

m3 = 0: curl(grad)

m3 = 1: div(curl)

m3 = 2: div(grad)

5. Calculate

6. Find T! and T-th Fibonacci number.

http://mathworld.wolfram.com/GammaFunction.html

https://en.wikipedia.org/wiki/Fibonacci\_number

**Linear approximation:**

7. Calculate using linear approximation.

8. Calculate Riemann sum for integral

for T intervals.

**Truncation error:**

9. Perform errors analysis for the linear, quadratic, and cubic approximations for (1+1/T)6.

**Error bounds for integration:**

10. Perform the errors analysis for the integral error bounds for x6 @[0, 1] taking 2T intervals.

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/error4bounds4integration.docx

11. Explain the formulas:

m4 = 0: Left and right rectangles

m4 = 1: Mid-rectangles

m4 = 2: Trapezoidal rule

m4 = 3: Simpson rule

12. How many petals are there in the flower R = cos(TA)?

13. Plot the graphs in polar coordinates and parametric curves.

m4 = 0: R = Acos(A)

m4 = 1: R = Asin(A)

m4 = 2: x = cos(t)sin(t), y = cos(t)

m4 = 3: x = Sin(t), y = tCos(t)

14. Prove the Jacobian expression.

m3 = 0: Polar coordinates.

m3 = 1: Cylindrical coordinates.

m3 = 2: Spherical coordinates.

15. Find the discriminant of the elliptic curve y2 = x3 + Lx + T. Find x for y = 0 at your elliptic curve.

16. Give the series convergence tests.

m3 = 0: ratio

m3 = 1: root

m3 = 2: integral

17. Calculate

m3 = 0: (a+ei) – (u – ki)

m3 = 1: (a+ei)(L – ki)

m3 = 2: (a+ei)/(m – ki)

18. If electromagnetic force is 1 N in our Universe then give the magnitude of

m3 = 0: gravity

m3 = 1: strong nuclear

m3 = 2: weak nuclear

https://www.quora.com/What-is-the-ratio-between-the-strength-of-strong-nuclear-force-electromagnetic-force-weak-nuclear-force-and-gravitational-force

19. Try to apply for all grants, scholarships, fellowships, etc. in embassies of USA, Canada, Europe, Australia, Japan, etc.

Project:

20. Improve your project.