1 individual task in 2 calculus:

Edited at 10am 27.3.2017.

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. m4 = s mod 4. m3 = s mod 3.

Orthogonal polynomials:

1. Expand sin(*T*x) in Legendre polynomial series. Take only terms 0, 1, 2, 3, 4.

2. Give the orthogonal polynomials number L.

https://en.wikipedia.org/wiki/Orthogonal\_polynomials

**Series:**

3. What is the hangover of *s* meter blocks?

4. Calculate

a. b. c.d.e.f.g.h. i.

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/pi25percent.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/alternating2harmonic2series.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/harmonic4series.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/inverse1power.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/inverse2powers.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/inverse3powers.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/inverse4powers.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/inverse5powers.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/inverse6powers.txt

5. Find

6. Find the convergence radius and the sum.

7. Calculate

8. Expand sin(Tx) in the Taylor Series around 0. Take only terms 0, 1, 2, 3, 4.

9. Expand f(x) = *T* in the Fourier Series. Take only terms 0, 1, 2, 3, 4.

10. Calculate the Inner Product of sin(*a*x) and cos(*m*x) at [0, 1].

Applications of integrals:

11. Calculate average value, center of mass and moment of inertia of f(x)=1+cos(Tx)@[1/s,1/k].

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http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/center\_of\_mass.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/y\_center\_of\_mass.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/curves\_center\_of\_mass.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/moment\_of\_inertia.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/x\_curves\_moment\_of\_inertia.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/y\_curves\_moment\_of\_inertia.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/corrected\_averages\_centers\_massess\_inertia\_moments.jpg

http://www.integral-calculator.com/

12. Find arc length of f(x) a. -0.006x2+0.3x@[1/s,11-1/k], b.1+cos(Tx)@[1/s,1/k], c.x2@[0,T].

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/arc1.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/arc2.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/arc3.txt

http://www.integral-calculator.com/

13. Calculate revolutionary volume and surface area of f(x) = 1 + cos(Tx) @ [1/s, 1/k].

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/volume\_of\_revolution.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/surface\_of\_revolution.txt

http://www.integral-calculator.com/

Shapes:

2-D shapes:

14. For each equation write ellipse or parabola, or hyperbola.

a. sx -7 –y + kx2 +xy = -0.0006ky2

b. -0.005kx +1 -0.003kxy + 0.0009ky2 +0.008kxy = 0.002kx2

c. -0.00002kxy – ky2 = 0.0007kyx + 6k – 0.00004kx2 – 45k – 4ky + 3kx

**Quadric 3-D shapes:**

15. Classify the shapes.

ax2 + mxy + Ly2 = 1

ax2 + my2 + Lz2 + kx + Ty + nz =1

Games:

16. Solve polygonal areas problem for:

m4 = 0: 4

m4 = 1: 6

m4 = 2: 8

m4 = 3: 9

Plot polygon using this plotter:

http://www.shodor.org/interactivate/activities/SimplePlot/

http://physics16.weebly.com/uploads/5/9/8/5/59854633/4polygonalareaszimmermann.xlsx

http://physics16.weebly.com/uploads/5/9/8/5/59854633/6polygonalareaszimmermann.xlsx

http://physics16.weebly.com/uploads/5/9/8/5/59854633/8polygonalareaszimmermann.xlsx

http://physics16.weebly.com/uploads/5/9/8/5/59854633/9polygonalareaszimmermann.xlsx

17. Join Dota2 gaming competition.

http://www.dota2.com/international/overview/

Project:

18. Improve your project.

Write the proposal.

Deadline: 31.3.2017 Friday.