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. $d\_{2}=\frac{T-L}{10}$. 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.$\sum\_{c=1}^{T}\frac{(-1)^{c}}{c}$ b.$\sum\_{c=1}^{T}\frac{1}{c}$ c.$\sum\_{c=1}^{T}c^{-4} $d.$\sum\_{c=1}^{T}c^{-6} $e.$\sum\_{c=0}^{T}b^{c} $f.$\sum\_{c=1}^{T}c^{-2} $g.$\sum\_{c=1}^{T}c^{-3} $h.$\sum\_{c=0}^{T}\frac{(-1)^{c}}{2c+1}$ i.$\sum\_{c=1}^{T}c^{-5}$

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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

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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 $\sum\_{c=0}^{\infty }T^{-c}$

6. Find the convergence radius and the sum.

$$\sum\_{c=0}^{\infty }\left(Tx\right)^{c}$$

7. Calculate $\sum\_{c=0}^{\infty }C(p,c)\left(Tx\right)^{c}$

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

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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

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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].

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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

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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.