D individual calculus task:

Edited at 10am 10 April 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.

m2 = s mod 2.

Translation:

1. Write the equation of the circumference of radius T with the center at (s, k).

2. Optimization:

Derive the equations, find all the values and give all the ratios for these optimization problems:

2.1. Given the perimeter P = *T* meters, find the maximum areas of the rectangle, the right angled triangle and any triangle.

Find the sides and the ratios of all sides of the rectangle and the triangles.

2.2. Given the surface area S = *T* squared meters, find the maximum volume of the cylinder and the cone (with lid and with no lid).

Find R, H and the ratios of R/H for all cases.

Complex numbers:

3. Calculate the expressions of the complex numbers.

3.1. Calculate: a. i-a b. i-L c. im d. i1/(L+2) e.

f. a – mi + Li – T g. (a – mi)(Ti – L) h. (m – ai)/(Li – T) j. (k – ni)L

p. (a – mi)1/(L+2) q. in u. ik w. iL z. ia

3.2. Calculate.

a.

b.

c.

d. (T+im)(a-Li)

e. (T+im)+(a-Li)

f. (T+im)-(a-Li)

Theorems of Calculus:

4. Green Theorem, Stokes Theorem and Gauss Law.

m3 = 0: Explain Green Theorem.

https://en.wikipedia.org/wiki/Green%27s\_theorem

m3 = 1: What is Stokes Theorem?

https://en.wikipedia.org/wiki/Stokes%27\_theorem

m3 = 2: Explain Gauss Law.

https://en.wikipedia.org/wiki/Gauss%27s\_law

Games:

5. Join Dota2 gaming competition.

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

Project:

6. Improve your project.

Write the proposal.

Prepare to present your project to a native English speaking doctor of science.

Deadline: 15.4.2017 Saturday.