Final revision paper in calculus:

Edited at 9am 15.1.2017.

Give 9 significant figures in each answer and give the correct order of magnitude.

Applications of integrals:

1. Calculate the area bellow the curve f(x)=1+cos(Tx)@[1/s,1/k].

2. Find the area between the curves f(x)=1+cos(Tx) and g(x)= 1+sin(Tx)@[1/s,1/k].

3. 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/corrected\_averages\_centers\_massess\_inertia\_moments.jpg

4. 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

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

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

6. Find

7. Calculate

8. Find

Numerical integration and error bounds:

9. Numerically calculate the integral and perform the errors analysis for the integral error bounds for x6 @[0, 1] taking 2T intervals.

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http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/right-rectangles-numerical-integration-method.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/mid-rectangles-numerical-integration-method.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/trapezoidal-rule-numerical-integration-method.txt

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/simpson-rule-numerical-integration-method.txt

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

Linking calculus to discrete math:

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

Exponential growth and decay:

11. For what x is eLx = 0.5?

12. Two computer companies make computers whose power increases: the first computers increase their power 2T% every two years and the second T% every year. Which computer power grows faster? Why?

13. What gives the greater value 0.1T% decay in 2 years or 0.05T % every year? Why?

Linear, quadratic and cubic approximations:

14. Calculate using linear approximation.

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15. Find the linear, quadratic and cubic approximations for (1+1/T)6.

Perform the error analysis.

Sequences and series:

16. Calculate π and hangover for T terms in each of the series.

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Fractals:

17. Draw the fractals. ReC = 1 / s. ImC = 1 / T.

Draw a fractal https://www.wolframalpha.com/input/?i=Julia+set+0.1%2B0.05i

http://calculus12s.weebly.com/uploads/2/5/3/9/25393482/draw\_fractal.txt

Differential equations:

18. Find y(x) from

a. y´ = Ty.

b. T + y2 + xyy´ = 0.

c. ky´´ + Ty´ + Ly = 0.

Zimmermann:

19. Solve Zimmermann Polygonal Areas problem.

http://azspcs.com/Contest/PolygonalAreas

Submit as many different areas solutions as possible in the form (1,2), (2,6), (3,4), (4,5), (6,3), (5,1) going clockwise or anti-clockwise along the border of the polygon for 11, 17, 23, 29, 37, 47, 59, 71, 83, 97, 113, 131, 149, 167, 191, 223, 257, 293, 331, 373, 419, 467, 521. For each problem we need maximum and minimum areas polygons.

http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/11polygonal11areas11zimmermann11.txt

Project:

20. Improve your project.

Deadline: before the final exam.