D individual physics 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.

Mechanics:

Center of mass:

1. Find the center of mass of k equal masses k meters apart located on a straight line.

Statics:

2. Find the hangover for the s blocks in the blocks stacking problem.

Oscillations:

3. Find the displacement of a harmonic oscillator after s seconds with amplitude k, frequency k and initial phase k/2.

4. Solve the string oscillatory equation for v = T. Find the displacement after s seconds at m meters.

5. Fluids:

m2 = 0: Explain Bernoulli Principle.

m2 = 1: What is Magnus Effect?

Thermodynamics:

6. The thermal expansion rate α is 1/k. The temperature change is T degrees.

a. Find the extension of m meters rod due to the temperature change.

b. Find the approximate volume change of m meters cubed cube due to the temperature change.

7. There are two bodies in a thermodynamically isolated system: C1 m1 T1 and C2 m2 T2. Find the resulting temperature T. m1 = k, m2 = 2k. C1 = k/11, C2 = k/222, T1 = k/111, T2 = k/22

8. Estimate the distances between the atoms of element number T in the periodic table of elements.

Project:

9. Improve your project.

Write the proposal.

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

Deadline: 15.4.2017 Saturday.