UTS in physics made by Michael Marchenko in October of 2019.

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s is your student number.

Write your student number: s = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Write your name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

s is your student number.

k = s mod 10000. T = s mod 100.

m35 = s mod 35. m25 = s mod 25. m20 = s mod 20.

m10 = s mod 10. m9 = s mod 9. m8 = s mod 8. m7 = s mod 7. m6 = s mod 6.

m5 = s mod 5. m4 = s mod 4. m3 = s mod 3. m2 = s mod 2.

1. Describe your project.

Choose topic and write research paper about it.

2. Find F = ma, M = Jε, for m = a = J = ε = T.

3. Find x and y for projectile with x0 = y0 = 0, v0 = T m/s, t = T seconds, A = T degrees.

Find maximum distance and maximum height.

https://physics16.weebly.com/uploads/5/9/8/5/59854633/projectile309task2019.txt

4. Find the angular speed and total acceleration for the rotational motion of the material point around the circumference with radius of T meters and constant linear speed of s meters per second.

https://physics16.weebly.com/uploads/5/9/8/5/59854633/omega\_acceleration309task2019.txt

5. Find gravity acceleration g, orbital velocity Vo and escape velocity Ve for planet with mass s billion tons and radius s millimeters.

https://physics18.weebly.com/uploads/5/9/8/5/59854633/g1orbital1velocity1escape1velocity13oct2017.txt

6. Calculate the Schwarzschild radius for the k grams desk.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/radius4schwarzschild.txt

7. Solve oscillation problem y'' + yT2 = 0.

https://www.wolframalpha.com/input/?i=y%27%27+%2B+16y+%3D+0

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

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/harmonic4oscillator.txt

9. Solve the string oscillatory equation for v = T, frequency = L = m10, Amplitude = T.

 Find the displacement after s seconds at m meters.

 https://physics18.weebly.com/uploads/5/9/8/5/59854633/string1wave1oscillation22oct2017.txt

10. 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.

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/thermal4expansion.txt

11. 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

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/result4temperature.txt

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

https://physics16.weebly.com/uploads/5/9/8/5/59854633/distance\_between\_particles\_for\_many\_atoms2019oct.txt

http://physics16.weebly.com/uploads/5/9/8/5/59854633/distance\_between\_particles.txt

13. Scattering:

m3 = 0: What color is the Sun?

m3 = 1: Why are clouds white?

m3 = 2: Why is the sky blue?

14. Find the force between two charges of L and T Coulombs, m meters apart.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/coulomb\_force.txt

15. Solve the simplified Maxwell Equations for c = 300000000-s, red light. Take amplitude 1 V/m. Find the intensity of electric field after s seconds at m meters.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/maxwell\_equations\_solution.txt

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

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/hangover.txt

17. Suppose a star has a surface temperature of 4k degrees. What are the wavelength and the color this star appears?

http://physics16.weebly.com/uploads/5/9/8/5/59854633/color4black4body.txt

18. Calculate the final speed after absolutely inelastic collision of two balls of masses L kg and T kg, moving with velocities s m/s and k m/s respectively.

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/inelastic4collision.txt

19. Solve the elastic collision problem for u1 = k, u2 = k/2, m1 = k, m2 = 2k.

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/linear2elastic4collision.txt

20. Find the acceleration of a simple pulley for two masses: L kg and T kg.

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/problem4pulleys.txt

21. Find acceleration of a mass at the inclined plane with

 A = T degrees and the friction coefficient μ = 1/T.

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/inclined4plane.txt

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

 http://physics16.weebly.com/uploads/5/9/8/5/59854633/center\_of\_mass\_of\_k\_masses.txt

23.

m4 = 0: What visible light is the fastest? Why?

m4 = 1: What visible light is the most noticeable? Why?

m4 = 2: What visible light has the most energy? Why?

m4 = 3: What visible light is the most absorbed? Why?

L = 6: 24. What is quantum money?

L = 7: 25. Are massless or mass-full particles used in quantum information? Why?

26. Find V1 for the transformer if V2 = T volts, N1 = k and N2 = s.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/transformer.txt

27. T kilowatts of electric power is sent to a town from a power plant. The transmission lines have the total resistance of 0.1T Ohms. Calculate the power loss if the power is transmitted at:

(a) 0.03k Volts (b) s Volts

http://physics16.weebly.com/uploads/5/9/8/5/59854633/losses4transmitting4power.txt

28. A circular coil of wire has a diameter of 0.002k cm and contains 10 loops. The current in each loop is 3A, and the coil is placed into 2TESLA external magnetic field. Determine the maximum and minimum torque exerted on the coil by the field.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/torque.txt

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29. Calculate the series and the parallel circuits with e.m.f. of T Volts and the resistors L+1, 2 and 3 ohms respectively.

http://physics18.weebly.com/uploads/5/9/8/5/59854633/series\_parallel\_circuits.txt

30. Find the electrical current i in the circuit for R = T, L = 1/k, C = 1/s, ω = k, and εm = T.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/2054\_ch21a.pdf

31. A man 0.25k mm tall stands in front of a vertical plane mirror. His eyes are 10 cm bellow the top of his head. What are the sizes and the best location of the smallest possible mirror so that he can see his entire body?

http://physics16.weebly.com/uploads/5/9/8/5/59854633/height4mirror.txt

32. For convex mirror with a radius of curvature of 0.002k meters, determine the location of the image and its magnification for an object 0.0012k meters from the mirror.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/mirror.txt

33. A spy satellite camera can recognize T cm objects from the altitude of n meters. If diffraction was the only limitation (the wave length Lambda = 0.1k nanometers), determine what diameter lens the camera has.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/satellite4spying.txt

34. Find the frequency and the period of the harmonic oscillator. L = k μH and C = T μF.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/rlc4circuit4natural4frequency4period.txt

35. Find energy and momentum of photon of s Hz frequency.

36. Calculate the energy and momentum of a photon for Lambda = 0.05k nanometers.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/energy4photon.txt

37. Determine the wavelength of an electron that has been accelerated through the potential difference of T Volts.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/wavelength4electron.txt

38. Calculate the wavelength of k grams desk moving T centimeters per second.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/waves4matter.txt

39. What is the matter wave length of T gram book?

40. Find the energy level and angular momentum for hydrogen according to the Bohr Model.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/bohr.txt

41. Find the annihilation energy of k grams of matter.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/energy4binding.txt

42. If your velocity would be $v=\left(1-\frac{1}{e+2}\right)c$ then how would your height, mass, and time change?

43. Calculate the remaining mass (it is NOT 0) of the decaying substance after k seconds if the decay ratio is T and initial mass is s. Calculate the half-life.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/code4nuclear4decay4half4life.txt

44. Perform correlation and regression analyses of the periodic table for T+2 elements and for m7 + 3 elementary particles.

http://physics16.weebly.com/uploads/5/9/8/5/59854633/correlations4periodic4table.xlsx

http://physics16.weebly.com/uploads/5/9/8/5/59854633/regression4periodic4table.txt

http://physics16.weebly.com/uploads/5/9/8/5/59854633/evergy4lifetime.xlsx

http://physics16.weebly.com/uploads/5/9/8/5/59854633/regression4elementary4particles4energies4life4times.txt

m3 = 0: 45. What particles mediate electromagnetic interaction?

A. electrons

B. protons

C. positrons

D. photons

m3 = 1: 46. What particles mediate strong interaction?

A. neutrons

B. gluons

C. photons

D. protons

m3 = 2: 47. How many times is Electromagnetic Force weaker than the Strong Force?

A. 137

B. 758

C. 3592

D. 126434

48. Find the energy of the photon with the frequency of s Hz.

E2 = (mc2)2 + (pc)2.