PHYSICS HL-requirements for IB candidates

1. Physical quantities
2. Scalar and vector quantities
3. SI system of units
4. Significant figures in all calculations
5. Mathematical methods in physics-vectors, decomposition of vectors into components, net vector, Cartesian coordinate system, distance between two points in the plane of motion, vector representation of formulas, sum of vectors, dividing of vectors, exponential notation for the results of calculations, elementary trigonometric function, vector coordinates.
6. **Experiments in physics**
a. Graph analysis
b. Linear function in physics-plots and mathematical description
c. Correct presentation of graphs
d. Determination from the graph tangent to the curve
e. Planning of experiment (apparatuses, theoretical model, units and methodology of experiment)
f. Analysis of experimental results - conclusions, simple analysis of errors and estimation of uncertainties
g. Writing of the experimental results with appropriate precision and with correct units
7. Newton's laws of dynamics and reference systems
8. Uniform motion and linear motion-average velocity, distance and position vector
9. Circular motion and centripetal force
10. Condition for the static equilibrium of a physical body
11. Resulting force and its dependence on acceleration of the particle
12. Reaction force and frictional force (force diagram for body)
13. Conservation law of energy-mechanical energy(kinetic energy, potential energy and elastic energy)
14. Gravitational field-uniform and central field (presentation of the force lines of field)
15. Gravitational force for two spherical masses
16. Kepler laws for motion of planets around the Sun

17. Gravitational strength vector and its interpretation

18. Gravitational acceleration in the free fall

19. Gravitational potential and its relation with the work done by the external force

20. Work in uniform and central gravitational field

21. Escape velocity