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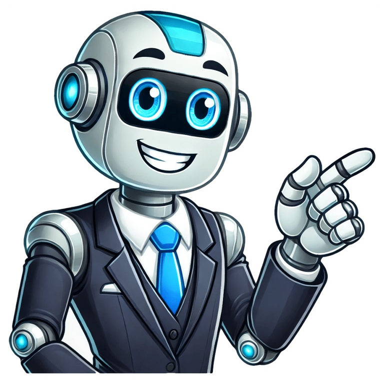

 Physics is that branch of science that basically deals with the prime constituents of matter, its characteristics and behaviour and different related elements of force and energy. Physics formulas are not meant to be memorised but conveyed in real-time and space. The application of the formulas of physics includes the concepts of mathematics and its formulas. It is also important to remember that if one is unable to crack the theoretical part of physics, that is, understanding the theories properly, one can never find any relation between the formulas. In order to make the understanding easier, it is also recommended to know the S.I. units of Physics well. List of All Physics Formulas Given below is the list of all Physics formulas: Physics Formulas Formulas Average Speed Formula S = d/t Acceleration Formula a =v-u/t Density Formula P=m/V Power Formula P=W/t Newton's Second Law F = m × a Weight Formula W=mg Pressure Formula P=F/A Ohm's Law Formula V= I × R Kinetic Energy Formula E = ½ mv² Frequency Formula F =v/λ Pendulum Formula T = 2π√L/g Fahrenheit Formula F = (9/5× °C) + 32 Work Formula W = F × d × cosθ Torque Formula T = F × r × sinθ Displacement Formula ΔX = Xf–Xi Mass Formula F = m × a or m = F/m Amplitude Formula x = A sin (ωt + ϕ) Tension Formula T= mg+ma Surface Charge Density Formula σ = q / A Linear Speed Formula V(linear speed) = ΔS/ΔT Position Formula Δx=x2−x1 Heat of Fusion Formula q = m × ΔHF Gravity Formula F α m₁m₂/r₂ Spring Potential Energy Formula P.E=1/2 k × x2 Physics Kinematics Formula v2=v2o+2a(x-xo) DC Voltage Drop Formula V=I × R Hubble's Law Formula v = Ho r Induced Voltage Formula e = – N(dΦB/dt) Latent Heat Formula L = Q / M Wavelength Formula λ = v/f Gravitational Force Formula F = G(m1m2)/R2 Potential Energy Formula PE = mgh Strain Energy Formula U = Fδ / 2 Friction Force Formula f = μN Cell Potential Formula E0cell = E0red – E0oxid Shear Modulus Formula (shear stress)/(shear strain) = (F/A)/(x/y) Water Pressure Formula Water pressure= ρ g h Refractive Index Formula n = c/v Centroid Formula C = [(x1 + x2 + x3)/ 3, (y1 + y2 + y3)/ 3] Important Physics Formulas Given below is the most important Physics formulae list: Planck constant h = 6.63 × 10−34 J.s = 4.136 × 10-15 eV.s Gravitation constant G = 6.67×10−11 m3 kg−1 s−2 Boltzmann constant k = 1.38 × 10−23 J/K Molar gas constant R = 8.314 J/(mol K) Avogadro's number NA = 6.023 × 1023 mol−1 Charge of electron e = 1.602 × 10−19 C Permittivity of vacuum 0 = 8.85 × 10−12 F/m Coulomb constant 1/4πε0 = 8.9875517923(14) × 109 N m2/C2 Faraday constant F = 96485 C/mol Mass of electron me = 9.1 × 10−31 kg Mass of proton mp = 1.6726 × 10−27 kg Mass of neutron mn = 1.6749 × 10−27 kg Stefan-Boltzmann constant σ = 5.67 × 10−8 W/(m2 K4) Rydberg constant R∞ = 1.097 × 107 m−1 Bohr magneton μB = 9.27 × 10−24 J/T Bohr radius a0 = 0.529 × 10−10 m Standard atmosphere atm = 1.01325 × 105 Pa Wien displacement constant b = 2.9 × 10−3 m K . Wave = Δx Δt wave = average velocity Δx = displacement Δt = elapsed time. Vavg = (vi + vf*)2 Vavg = The average velocity vi = initial velocity vf = final velocity a = acceleration Δv = change in velocity Δt = elapsed time. Δx = the displacement vi = the initial velocity Δt = the elapsed time a = the acceleration Δx = displacement vf = is the final velocity Δt = elapsed time a = acceleration F = force m = mass a = acceleration W = weight m = mass g = acceleration which is due to gravity. f = friction force μ = coefficient of friction N = normal force p = mv W = F d cos θ or W = F!d W = work t F = force d = distance θ = angle between F and the direction of motion KE = kinetic energy m = mass v = velocity PE = potential energy m = mass g = acceleration due to gravity h = height W = work done KE = kinetic energy. P = power W = work Δt = elapsed time Solved Examples Q.1. Calculate the dc voltage drop if the circuit length is 500 cms and in it 10 A of current flows in 20 s ? Solution: The DC voltage drop is given as : V=L×I/T where, I = current through the circuit in Amperes. L = Length of the circuit in metres T = time for which the current has flowed through the circuit in seconds V = Voltage in Volts. So, V=500×10/20 V = 0.25 Volts. Q.2. The spring constant of a stretched string is 50Nm−1 and displacement is 20 cm. Compute potential energy stored in the stretched string. Solution: Given parameters are, k=50Nm−1 x = 20 cm = 0.2 m Potential energy will be: P.E=1/2k×x2 =½ X 50×(0.2)2 = 1 J Q.3. A body moves along the x- axis according to the relation x=1–2t+3t2x=1–2t+3t2x = 1 – 2 t + 3t^{2}, where x is in metres and t is in seconds. Find the Acceleration of the body when t = 3s Solution: We have, x=1–2t+3t2x=1–2t+3t2x = 1 – 2 t + 3t^{2}then; Velocity v= dx/dt= −2+6t v= dx/dt= −2+6t Acceleration: v=dv/dt =6(m/s2) Q.4. Calculate the weight of an object on the moon which weighs 50kg on earth. Solution: Here weight = mass x gravitational acceleration = m x g = 50 kg x 1.6 m/s2 = 80 Kg m/s2 Q.5. Find the displacement covered by an object which accelerates from rest to 60 m/s in 3s. Solution: Initial velocity = 0 and final velocity = 60 m/s Time taken = 3s Therefore, acceleration = 60/3 = 20m/s2. Displacement (S) = ut + ½ at2 = 90 m Q.6. A person goes from Point A to Point B in 10s and returns back in 8s. If the distance between A and B is 36m, find the average speed of the person. Solution: Here total distance covered = 72m Total time taken = 18s Therefore, average speed = Total distance covered/Total time taken =72/18 Total distance covered total time taken=7218 = 4 m/s. Q.7. If an object is moving with a velocity of 5 m/s and has a kinetic energy of 100J, Find its mass. Solution: We know that KE = ½ mv2 100 = ½ x m x 5 x 5 100 = 25 m/2 m = 100×2/25 = 200/25 = 8 kg Q.8. A long thin rod of length 50 cm has a total charge of 5 mC uniformly distributed over it. Find the linear charge density. Solution: q = 5 mC = 5 × 10–3 C, l= 50 cm = 0.5 m. λ=? λ=ql =(5×10^−3)/0.5 =(5×10^−3)/0.5 =10^-2Cm^−1 Q.9. A car is travelling with a velocity of 10 m/s and it has a mass of 250 Kg. Compute its Kinetic energy? Solution: As given here, Mass of the body, m = 250 Kg, Velocity of it, v = 10 m/s, So Kinetic energy will be as: E = 1/2mv^2 E = 1/2×250×10^2 = 125 ×100 E = 12500 joules Q.10. The heat needed for a phase transfer of a 2 kg substance is 400k.cal. Determine its latent heat. Solution: Given parameters are, Q = 400 k.cal M = 2 kg The formula for latent heat is given by, L = Q / M L = 400 / 2 L = 200 k.cal/kg the free encyclopedia that anyone can change. Search the 270,285 articles in the Simple English Wikipedia How to write Simple English pages · Useful pages · Simple talk · Categories · Help Schools Gateway (for users who want to make changes from a school) This is the front page of the Simple English Wikipedia. Wikipedias are places where people work together to write encyclopedias in different languages. We use Simple English words and grammar here. The Simple English Wikipedia is for everyone, such as children and adults who are learning English. There are 270,285 articles on the Simple English Wikipedia. All of the pages are free to use. They have all been published under both the Creative Commons Attribution/Share-Alike License 4.0 International License and the GNU Free Documentation License. You can help here! You may change these pages and make new pages. Read the help pages and other good pages to learn how to write pages here. If you need help, you may ask questions at Simple talk. When writing articles here: Use Basic English words and shorter sentences. This allows people to understand complex terms or phrases. Write good pages. The best encyclopedia pages have useful, well-written information. Use the pages to learn and teach. These pages can help people learn English. You can also use them to make a new Wikipedia to help other people. Simple does not mean short. Writing in Simple English means that simple words are used. It does not mean readers want basic information. Articles do not have to be short to be simple; expand articles, add details, but use basic vocabulary. Be bold! Your article does not have to be perfect, because other editors will fix it and make it better. And most importantly, do not be afraid to start and make articles better yourself. Le Spectre de la rose (English: The Spirit of the Rose) is a short ballet. It is about a young girl who dreams of dancing with the spirit of a souvenir rose from her first ball. Jean-Louis Vaudoyer wrote the ballet story. He based it on a verse by Théophile Gautier. The dances were designed by Michel Fokine. The music was Hector Berlioz's 1841 orchestration of Carl Maria von Weber's piano music Afforderung zum Tanz (English: Invitation to the Dance). Léon Bakst designed the sets and costumes. The ballet was first presented in Monte Carlo on 19 April 1911. Vaslav Nijinsky danced The Rose and Tamara Karsavina danced The Young Girl. Spectre became internationally famous for the leap (jump) Nijinsky made through a window at the ballet's end. After it was presented, the ballet was described as "immediate success" by writer Grace Robert. more... 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This article provides a comprehensive physics formulas list, that will act as a ready reference, when you are solving physics problems. You can even use this list, for a quick revision before an exam.Home / Uncategorized / A Comprehensive List of All the Physics Formulas Learning physics is all about applying concepts to solve problems. This article provides a comprehensive physics formulas list, that will act as a ready reference, when you are solving physics problems. You can even use this list, for a quick revision before an exam. Physics is the most fundamental of all sciences. It is also one of the toughest sciences to master. Learning physics is basically studying the fundamental laws that govern our universe. I would say that there is a lot more to ascertain than just remember and mug up the physics formulas. Try to understand what a formula says and means, and what physical relation it expounds. If you understand the physical concepts underlying those formulas, deriving them or remembering them is easy. This ScienceStruck article lists some physics formulas that you would need in solving basic physics problems. Physics Formulas Mechanics Friction Moment of Inertia Newtonian Gravity Projectile Motion Simple Pendulum Electricity Thermodynamics Electromagnetism Optics Quantum Physics Derive all these formulas once, before you start using them. Study physics and look at it as an opportunity to appreciate the underlying beauty of nature, expressed through natural laws. Physics help is provided here in the form of ready to use formulas. Physics has a reputation for being difficult and to some extent that's true, due to the mathematics involved. If you don't wish to think on your own and apply basic physics principles, solving physics problems is always going to be tough. Our physics formulas list is aimed at helping you out in solving problems. The joy of having solved a physics problem on your own, is worth all the effort! Understanding physics concepts challenges your imagination and thinking potential, wherein, if you visualize a problem, then you can come up with a solution. So here is the promised list which will help you out. Mechanics Mechanics is the oldest branch of physics. Mechanics deals with all kinds and complexities of motion. It includes various techniques, which can simplify the solution of a mechanical problem. Motion in One Dimension The formulas for motion in one dimension (Also called Kinematical equations of motion) are as follows. (Here 'u' is initial velocity, 'v' is final velocity, 'a' is acceleration and t is time): s = ut + ½ at2 v = u + at v2 = u2 + 2as vav (Average Velocity) = (v+u)/2 Momentum, Force and Impulse Formulas for momentum, impulse and force concerning a particle moving in 3 dimensions are as follows (Here force, momentum and velocity are vectors ): Momentum is the product of mass and velocity of a body. Momentum is calculate using the formula: P = m (mass) x v (velocity) Force can defined as something which causes a change in momentum of a body. Force is given by the celebrated newton's law of motion: F = m (mass) x a (acceleration) Impulse is a large force applied in a very short time period. The strike of a hammer is an impulse. Impulse is given by I = m(v-u) Pressure Pressure is defined as force per unit area: Pressure (P) = Force (F) Area (A) Density is the mass contained in a body per unit volume. The formula for density is: Density (D) = Mass(M) Volume (V) Angular Momentum Angular momentum is an analogous quantity to linear momentum in which the body is undergoing rotational motion. The formula for angular momentum (J) is given by: J = r x pwhere J denotes angular momentum, r is radius vector and p is linear momentum. Torque Torque can be defined as moment of force. Torque causes rotational motion. The formula for torque is: τ = r x F, where τ is torque, r is the radius vector and F is linear force. Circular Motion The formulas for circular motion of an object of mass 'm' moving in a circle of radius 'r' at a tangential velocity 'v' are as follows: Centripetal force (F) = mv2 r Centripetal Acceleration (a) = v2 r Center of Mass General Formula for Center of mass of a rigid body is : R = ΣNi = 1 miri ΣNi = 1mi where R is the position vector for center of mass, r is the generic position vector for all the particles of the object and N is the total number of particles. Reduced Mass for two Interacting Bodies The physics formula for reduced mass (μ) is : where m1 is mass of the first body, m2 is the mass of the second body. Work and Energy Formulas for work and energy in case of one dimensional motion are as follows: W (Work Done) = F (Force) x D (Displacement) Energy can be broadly classified into two types, Potential Energy and Kinetic Energy. In case of gravitational force, the potential energy is given by P.E.(Gravitational) = m (Mass) x g (Acceleration due to Gravity) x h (Height) The transitional kinetic energy is given by ½ m (mass) x v2(velocity squared) Power Power is, work done per unit time. The formula for power is given as where P=power, W = Work, t = time. Friction Friction can be classified to be of two kinds : Static friction and dynamic friction. Static Friction: Static friction is characterized by a coefficient of static friction μ . Coefficient of static friction is defined as the ratio of applied tangential force (F) which can induce sliding, to the normal force between surfaces in contact with each other. The formula to calculate this static coefficient is as follows: μ = Applied Tangential Force (F) Normal Force(N) The amount of force required to slide a solid resting on flat surface depends on the co efficient of static friction and is given by the formula: FHorizontal = μ x M(Mass of solid) x g (acceleration) Dynamic Friction: Dynamic friction is also characterized by the same coefficient of friction as static friction and therefore formula for calculating coefficient of dynamic friction is also the same as above. Only the dynamic friction coefficient is generally lower than the static one as the applied force required to overcome normal force is lesser. Moment of Inertia Here are some formulas for Moments of Inertia of different objects. (M stands for mass, R for radius and L for length): Object Axis Moment of Inertia Disk Axis parallel to disc, passing through the center MR2/2 Disk Axis passing through the center and perpendicular to disc MR2/2 Thin Rod Axis perpendicular to the Rod and passing through center ML2/12 Solid Sphere Axis passing through the center 2MR2/5 Solid Shell Axis passing through the center 2MR2/3 Newtonian Gravity Here are some important formulas, related to Newtonian Gravity: Newton's Law of universal Gravitation: where m1, m2 are the masses of two bodies G is the universal gravitational constant which has a value of 6.67300 × 10-11 m3 kg-1 s-2 r is distance between the two bodies Formula for escape velocity (vesc) = (2GM / R)1/2where, M is mass of central gravitating body R is radius of the central body Projectile Motion Here are two important formulas related to projectile motion: (v = velocity of particle, v0 = initial velocity, g is acceleration due to gravity, θ is angle of projection, h is maximum height and l is the range of the projectile.) Maximum height of projectile (h) = v0 2sin2θ 2g Horizontal range of projectile (l) = v0 2sin 2θ / g Simple Pendulum The physics formula for the period of a simple pendulum (T) = 2π √(l/g)where l is the length of the pendulum g is acceleration due to gravity Conical PendulumThe Period of a conical pendulum (T) = 2π √(lcosθ/g)where l is the length of the pendulum g is acceleration due to gravity Half angle of the conical pendulum Electricity Here are some formulas related to electricity. Ohm's Law Ohm's law gives a relation between the voltage applied a current flowing across a solid conductor: V (Voltage) = I (Current) x R (Resistance) Power In case of a closed electrical circuit with applied voltage V and resistance R, through which current I is flowing, = I2R. . . (because V = IR, Ohm's Law) Kirchoff's Voltage Law For every loop in an electrical circuit: ΣiVi = 0where Vi are all the voltages applied across the circuit. Kirchoff's Current Law At every node of an electrical circuit: ΣiIi = 0where Ii are all the currents flowing towards or away from the node in the circuit. Resistance The physics formulas for equivalent resistance in case of parallel and series combination are as follows:Resistances R1, R2, R3 in series: Req = R1 + R2 + R3 Resistances R1 and R2 in parallel: For n number of resistors, R1, R2...Rn, the formula will be: 1/Req = 1/R1 + 1/R2 + 1/R3...+ 1/Rn Capacitors A capacitor stores electrical energy, when placed in an electric field. A typical capacitor consists of two conductors separated by a dielectric or insulating material. Here are the most important formulas related to capacitors. Unit of capacitance is Farad (F) and its values are generally specified in mF (micro Farad = 10 -6 F). Capacitance (C) = Q / V Energy Stored in a Capacitor (Ecap) = 1/2 CV2= 1/2 (Q2 / C) = 1/2 (QV) Current Flowing Through a Capacitor I = C (dV / dt) Equivalent capacitance for 'n' capacitors connected in parallel: Ceq (Parallel) = C1 + C2 + C3...+ Cn = Σi=1 to n Ci Equivalent capacitance for 'n' capacitors in series: 1 / Ceq (Series) = 1 / C1 + 1 / C2...+ 1 / Cn = Σi=1 to n (1 / Ci) Here C is the capacitance Q is the charge stored on each conductor in the capacitor V is the potential difference across the capacitor Parallel Plate Capacitor Formula: C = kε0 (A/d) Where k = dielectric constant (k = 1 in vacuum) ε0 = Permittivity of Free Space (= 8.85 × 10-12 C2 / Nm2) A = Plate Area (in square meters) d = Plate Separation (in meters) Cylinrical Capacitor Formula: C = 2π kε0 [L / ln(b / a)] Where k = dielectric constant (k = 1 in vacuum) ε0 = Permittivity of Free Space (= 8.85 × 10-12 C2 / Nm2) L = Capacitor Length a = Inner conductor radius b = Outer conductor radius Spherical Capacitor Formula: C = 4π kε0 [(ab)/(b-a)] Where k = dielectric constant (k = 1 in vacuum) ε0 = Permittivity of Free Space (= 8.85 × 10-12 C2 / Nm2) a = Inner conductor radius b = Outer conductor radius Inductors An inductor is an electrical component which resists the flow of electrons or electric current through it. This property of inductance, in these devices, is caused by the electromotive force, created by magnetic field induced in them. The unit of inductance is Henry. Here are some important formulas associated with inductors. Energy Stored in Inductor (Estored) = 1/2 (LI2) Where, L is inductance and I is the current flowing through the inductor. Inductance of a cylindrical air core Coil (L) = (m0KN2A / l) Where L is inductance measured in Henries N is the number of turns on the coil A is cross-sectional area of the coil m0 is the permeability of free space (= 4π × 10-7 H/m) K is the Nagaoka coefficient l is the length of coil Inductors in a Series Network For inductors, L1, L2...Ln connected in series, Leq = L1 + L2...+ Ln (L is inductance) Inductors in a Parallel Network For inductors, L1, L2...Ln connected in parallel, 1 / Leq = 1 / L1 + 1 / L2...+ 1 / Ln Thermodynamics Formulas Thermodynamics is a vast field providing an analysis of the behavior of matter in bulk. It's a field focused on studying matter and energy in all their manifestations. Here are some of the most important formulas associated with classical thermodynamics and statistical physics. First Law of Thermodynamics dU = dQ + dW where, dU is the change in internal energy, dQ is the heat absorbed by the system and dW is the work done on the system. Thermodynamic Potentials All of thermodynamical phenomena can be understood in terms of the changes in five thermodynamic potentials under various physical constraints. They are Internal Energy (U), Enthalpy (H), Helmholtz Free Energy (F), Gibbs Free Energy (G), Landau or Grand Potential (Φ). Each of these scalar quantities represents the potentiality of a thermodynamic system to do work of various kinds under different types of constraints on its physical parameters. Thermodynamic Potential Defining Equation U is Energy T is temperature S is Entropy N is particle number μ is Chemical Potential p is Pressure V is Volume H is Enthalpy G is Gibbs Free Energy Φ is Grand Potential F is Helmholtz Free Energy Internal Energy (U) dU = TdS − pdV + μdN Enthalpy (H) H = U + pVdH = TdS + Vdp + μdN Gibbs Free Energy (G) G = U – TS + pV = F + pV = H – TSdG = -SdT + Vdp + μdN Helmholtz Free Energy (F) F = U – TSdF = – SdT – pdV + μdN Landau or Grand Potential Φ = F – μNdΦ = – SdT – pdV – Ndμ Ideal Gas Equations An ideal gas is a physicist's conception of a perfect gas composed of non-interacting particles which are easier to analyze, compared to real gases, which are much more complex, consisting of interacting particles. The resulting equations and laws of an ideal gas conform with the nature of real gases under certain conditions, though they fail to make exact predictions due the interactivity of molecules, which is not taken into consideration. Here are some of the most important physics formulas and equations, associated with ideal gases. Let's begin with the prime ideal gas laws and the equation of state of an ideal gas. Law Equation P is Pressure V is Volume T is Temperature n is the number of moles R is the ideal gas constant [= 8.3144621(75) J / K mol] N is the number of particles k is the Boltzmann Constant (= 1.3806488(13)×10-23) Boyle's Law PV = ConstantorP1V1 = P2V2(At Constant Temperature) Charles's Law V / T = ConstantorV1 / T1 = V2 / T2(At Constant Pressure) Amontons' Law of Pressure-Temperature P / T = ConstantorP1 / T1 = P2 / T2(At Constant Volume) Equation of State For An Ideal Gas PV = nRT = NkT Kinetic Theory of Gases Based on the primary assumptions that the volume of atoms or molecules is negligible, compared to the container volume and the attractive forces between molecules are negligible, the kinetic theory describes the properties of ideal gases. Here are the most important physics formulas related to the kinetic theory of monatomic gases. Pressure (P) = 1/3 (Nm v2) Here, P is pressure, N is the number of molecules and v2 is the mean squared particle velocity. Internal Energy (U) = 3/2 (NkT) Heat Capacities Heat Capacity at Constant Pressure (Cp) = 5/2 Nk = Cv + Nk Heat Capacity at Constant Volume (Cv) = 3/2 Nk Ratio of Heat Capacities (γ) = Cp / Cv = 5/3 Velocity Formulas Mean Molecular Velocity (Vmean) = [(8kT)/(πm)]1/2 Root Mean Square Velocity of a Molecule (Vrms) = (3kT/m)1/2 Most Probable Velocity of a Molecule (Vprob) = (2kT/m)1/2 Mean Free Path of a Molecule (λ) = (kT)/√2πd2P (Here P is in Pascals) Here N is the number of molecules, k is the Boltzmann constant, P is pressure, d is the molecular diameter, m is mass of the molecule and T is the gas temperature. Electromagnetism Here are some of the basic formulas from electromagnetism. The coulombic force between two charges at rest is Here, q1, q2 are charges ε0 is the permittivity of free space r is the distance between the two charges Lorentz Force The Lorentz force is the force exerted by an electric and/or magnetic field on a charged particle. (Lorentz Force) F = q (E + v x B) where q is the charge on the particle E and B are the electric and magnetic field vectors Relativistic Mechanics Here are some of the most important relativistic mechanics formulas. The transition from classical to relativistic mechanics is not at all smooth, as it merges space and time into one by taking away the Newtonian idea of absolute time. If you know what is Einstein's special theory of relativity, then the following formulas will make sense to you. Lorentz Transformations Lorentz transformations can be perceived as rotations in four dimensional space. Just as rotations in 3D space mixes the space coordinates, a Lorentz transformation mixes time and space coordinates. Consider two, three dimensional frames of reference S(x,y,z) and S'(x',y',z') coinciding with each other. Now consider that frame S' starts moving with a constant velocity v with respect to S frame. In relativistic mechanics, time is relative! So the time coordinate for the S' frame will be t' while that for S frame will be t. Consider The coordinate transformations between the two frames are known as Lorentz transformations and are given as follows:Lorentz Transformations of Space and Time x = γ (x' + vt') and x' = γ (x – vt) y = y' z= z' t = γ(t' + vx'/c2) and t' = γ(t – vx/c2) Relativistic Velocity Transformations In the same two frames S and S', the transformations for velocity components will be as follows (Here (Ux, Uy, Uz) and (Ux', Uy', Uz') are the velocity components in S and S' frames respectively): Ux = (Ux' + v) / (1 + Ux'v / c2) Uy = (Uy') / γ(1 + Ux'v / c2) Uz = (Uz') / γ(1 + Ux'v / c2) and Ux' = (Ux – v) / (1 – Uxv / c2) Uy' = (Uy) / γ(1 – Uxv / c2) Uz' = (Uz) / γ(1 – Uxv / c2) Momentum and Energy Transformations in Relativistic Mechanics Consider the same two frames (S, S') as in case of Lorentz coordinate transformations above. S' is moving at a velocity 'v' along the x-axis. Here again γis the Lorentz factor. In S frame (Px, Py, Pz) and in S' frame (Px', Py', Pz') are momentum components. Now we consider formulas for momentum and energy transformations for a particle, between these two reference frames in relativistic regime. Component wise Momentum Transformations and Energy Transformations Px = γ(Px' + vE' / c2) Py = Py' Pz = Pz' E = γ(E' + vPx) and Px' = γ(Px – vE' / c2) Py' = Py Pz' = Pz E' = γ(E – vPx) Physical Formulas for Quantities in Relativistic Dynamics All the known quantities in classical mechanics get modified, when we switch over to relativistic mechanics which is based on the special theory of relativity. Here are formulas of quantities in relativistic dynamics. Relativistic momentum p = γm0v where m0 is the rest mass of the particle. Rest mass energy E = m0c2 Total Energy (Relativistic) E = √(p2c2 + m02c4)) Optics Optics is one of the oldest branches of physics. There are many important optics physics formulas, which we need frequently in solving physics problems. Here are some of the important and frequently needed optics formulas. Snell's Law Sin i Sin r = n2 n1 = v1 v2 where i is angle of incidence r is the angle of refraction n1 is refractive index of medium 1 n2 is refractive index of medium 2 v1, v2 are the velocities of light in medium 1 and medium 2 respectively Gauss Lens Formula: 1/u + 1/v = 1/f where u – object distance v – image distance f – Focal length of the lens Lens Maker's Equation The most fundamental property of any optical lens is its ability to converge or diverge rays of light, which is measued by its focal length. Here is the lens maker's formula, which can help you calculate the focal length of a lens, from its physical parameters. 1 / f = [n-1][(1 / R1) – (1 / R2) + (n-1) d / nR1R2)] Here, n is refractive index of the lens material R1 is the radius of curvature of the lens surface, facing the light source R2 is the radius of curvature of the lens surface, facing away from the light source d is the lens thickness If the lens is very thin, compared to the distances – R1 and R2, the above formula can be approximated to: (Thin Lens Approximation) 1 / f ≈ (n-1) [1 / R1– 1 / R2] Compound Lenses The combined focal length (f) of two thin lenses, with focal length f1 and f2, in contact with each other: 1 / f = 1 / f1 + 1 / f2 If the two thin lenses are separated by distance d, their combined focal length is provided by the formula: 1 / f = 1 / f1 + 1 / f2 – (d / f1 – f2)) Newton's Rings Formulas Here are the important formulas for Newton's rings experiment which illustrates diffraction. nth Dark ring formula: r2n = nRλ nth Bright ring formula: r2n = (n + ½) Rλ where nth ring radius Radius of curvature of the lens Wavelength of incident light wave Quantum Physics Quantum physics is one of the most interesting branches of physics, which describes atoms and molecules, as well as atomic sub-structure. Here are some of the formulas related to the very basics of quantum physics, that you may require frequently. De Broglie Wave De Broglie Wavelength: where, λ- De Broglie Wavelength, h – Planck's Constant, p is momentum of the particle. Bragg's Law of Diffraction: 2a Sin θ = nλwhere a – Distance between atomic planes n – Order of Diffraction θ – Angle of Diffraction λ – Wavelength of incident radiation Planck Relation The plank relation gives the connection between energy and frequency of an electromagnetic wave: where h is Planck's Constant, v the frequency of radiation and ω = 2πv Uncertainty Principle Uncertainty principle is the bedrock on which quantum mechanics is based. It exposes the inherent limitation that nature imposes on how precisely a physical quantity can be measured. Uncertainty relation holds between any two non-commuting variables. Two of the special uncertainty relations are given below. Position-Momentum UncertaintyWhat the position-momentum uncertainty relation says is, you cannot predict where a particle is and how fast it is moving, both, with arbitrary accuracy. The more precise you are about the position, more uncertain will you be about the particle's momentum and vice versa. The mathematical statement of this relation is given as follows: where Δx is the uncertainty in position and Δp is the uncertainty in momentum. Energy-Time Uncertainty This is an uncertainty relation between energy and time. This relation gives rise to some astounding results like, creation of virtual particles for arbitrarily short periods of time! It is mathematically stated as follows: where ΔE is the uncertainty in energy and Δt is the uncertainty in time. This concludes my review of some of the important physics formulas. This list, is only representative and is by no means anywhere near complete. Physics is the basis of all sciences and therefore its domain extends over all sciences. Every branch of physics theory abounds with countless formulas. If you resort to just mugging up all these formulas, you may pass exams, but you will not be doing real physics. If you grasp the underlying theory behind these formulas, physics will be simplified. To view physics through the formulas and laws, you must be good at maths. There is no way you can run away from it. Mathematics is the language of nature! The more things we find out about nature, more words we need to describe them. This has led to increasing jargonization of science with fields and sub-fields getting generated. You could refer to a glossary of science terms and scientific definitions for any jargon that is beyond your comprehension. If you really want to get a hang of what it means to be a physicist and get an insight into physicist's view of things, read 'Feynman Lectures on Physics', which is highly recommended reading, for anyone who loves physics. It is written by one of the greatest physicists ever, Prof. Richard Feynman. Read and learn from the master. Solve as many problems as you can, on your own, to get a firm grasp of the subject. Sign up to receive the latest and greatest articles from our site automatically each week (give or take)...right to your inbox. Science Struck This website uses cookies to improve your experience. We'll assume you're ok with this, but you can opt-out if you wish. Cookie settingsAcceptPrivacy & Cookies Policy Physics is concerned with the study of the universe from the smallest to the largest scale: it is about unravelling its complexities to discover the way it is and how it works.Discoveries in physics have formed the foundation of countless technological advances and play an important role in many scientific areas. Many techniques used in medical imaging, nanotechnology and quantum computing are derived from physics instrumentation. Even the World Wide Web was a spin-off from the information processing and communications requirements of high-energy particle physics.The contributions of physics to solving global problems such as energy production, environmental protection, global warming and public health are essential and have an enormous impact on our society. ">Video of Physics at Oxford University Oxford has one of the largest university physics departments in the UK, with an outstanding and very diverse research programme in six sub-departments:AstrophysicsAtmospheric, Oceanic and Planetary PhysicsAtomic and Laser PhysicsCondensed Matter Physics (including BioPhysics)Particle PhysicsTheoretical Physics.Physics at Oxford is challenging and mathematical with a strong emphasis on fundamental concepts such as optics and relativity. There are two undergraduate courses, an MPhys and the BA. All applicants apply for the four-year MPhys in the first instance. The fourth-year MPhys option courses bring you to the threshold of current research, and can lead to subject specialism.The department is equipped with state-of-the-art lecture facilities and teaching laboratories. Tutorials give students direct and regular access to physicists actively involved in research and provide an opportunity to explore scientific ideas with experts in the field.Project work/international opportunitiesIn the third year, all students carry out a short project in the teaching laboratories. Students on both the BA and MPhys may have the opportunity to do industry projects investigating a real physics problem. There is further flexibility to undertake computational and experimental projects.A wide choice of fourth-year MPhys projects is available across all six physics sub-departments. 'I've always wanted to study physics. I saw Apollo 13 when I was about 13 years old and there's this bit where the scientists are trying to fit a square peg into a round hole – this made me want to work for NASA! But the more physics I study, the more I realise that there's so much awesome stuff apart from astrophysics; I've ended up focusing on condensed matter which gets me thinking about the applications of physics in the real world. Learning the theoretical stuff is all very well, but I like being able to get useful things out of it.I am president of the Oxford University Physics Society. One of the main things we do is get famous physicists in to speak to us. This can help students to remember the exciting, real-world cool stuff that got them into physics in the first place, even when they're struggling through reams of maths problem sheets.'Karla-Luise 'The tutorial system is one of the greatest things about studying at Oxford. Having to present your proofs and answers to world-leading mathematicians and academics on a twice-weekly basis can seem daunting, but it accelerates your understanding of difficult concepts and ideas, and equips you with the ability to deal with any other problems in a rigorous and precise way. The pace of the course is very rapid and the amount of material that is covered is vast. Very quickly, you will start to learn how to digest large volumes of information, understand it, and apply it to solving problems effectively. The ability to analyse situations critically, understand abstract problems and patterns, and apply a high level of computational knowledge are skills that are vital across all sectors and industries, both public and private, and are highly valued by employers.'SaraUnistats informationDiscover Uni course data provides applicants with Unistats statistics about undergraduate life at Oxford for a particular undergraduate course.Please select 'see course data' to view the full Unistats data for Physics. Please note that there may be no data available if the number of course participants is very small. Visit the Studying at Oxford section of this page for a more general insight into what studying here is likely to be like. Important Physics FormulasHere, provided all physics formulas in a simple format in our effort to create a repository where a scholar can get hold of any sought after formulas.Formula NameFormulaAccelerationa = (v - u) / tDensityP = m / VPressureP = F / AWorkW = F × d × cos(θ)Strain EnergyU = F × δ / 2Gravitational ForceF = G(m1 × m2) / R²Kinetic EnergyE = 1/2 × m × v²Induced Voltagee = - N(dΦB / dt)PendulumT = 2π√(L / g)Spring Potential EnergyPE = 1/2 × k × x²Wavelengthλ = v / fFriction Forcef = μ × NPotential EnergyPE = m × g × hTensionT = m × g + m × aCell PotentialE0cell = E0red - E0oxidHubble's Lawv = Ho × rLinear Speedv = ΔS / ΔTHeat of Fusionq = m × ΔHFSurface Charge Densityσ = q / ARefractive Indexn = c / vAmplitudex = A sin(ωt + φ)DC Voltage DropV = I × ROhm's LawV = I × RFahrenheitF = (9 / 5 × °C) + 32Acceleration Formulaa = (v - u) / tMassF = m × a or m = F / aFrequencyF = v / λNewton's Second LawF = m × aWork FormulaW = F × dDisplacementΔX = Xf - XiTorqueT = F × r × sin(θ)PositionΔx = x2 - x1Velocityv = Δx / ΔtGravity FormulaF ∝ m1 × m2 / r²Tension FormulaT = m × g + m × aVelocity Formulav = Δx / ΔtHubble's Law Formulav = Ho × rLatent HeatL = Q / MShear Modulus(shear stress) / (shear strain) = (F / A) / (x / y)Kinematics Formulav² = v0² + 2a(x - x0)Displacement FormulaΔX = Xf - XiSurface Charge Density Formulaσ = q / AWater PressurePwater = ρ × g × hFrequency FormulaF = v / λKinetic Energy FormulaE = 1/2 × m × v²Gravitational FormulaF = G(m1 × m2) / R²Refractive Index Formulan = c / vImportant Physics Constants ValuesPlanck constant h = 6.63 × 10−34 J.s = 4.136 × 10-15 eV.sGravitation constant G = 6.67×10−11 m3 kg−1 s−2Boltzmann constant k = 1.38 × 10−23 J/KMolar gas constant R = 8.314 J/(mol K)Avogadro's number NA = 6.023 × 1023 mol−1Charge of electron e = 1.602 × 10−19 CPermittivity of vacuum 0 = 8.85 × 10−12 F/mCoulomb constant 1/4πε0 = 8.9875517923(14) × 109 N m2/C2Faraday constant F = 96485 C/molMass of electron me = 9.1 × 10−31 kgMass of proton mp = 1.6726 × 10−27 kgMass of neutron mn = 1.6749 × 10−27 kgStefan-Boltzmann constant σ = 5.67 × 10−8 W/(m2 K4)Rydberg constant R∞ = 1.097 × 107 m−1Bohr magneton μB = 9.27 × 10−24 J/T Bohr radius a0 = 0.529 × 10−10 m Standard atmosphere atm = 1.01325 × 105 Pa Wien displacement constant b = 2.9 × 10−3 m K .Wave = Δx Δt wave = average velocity Δx = displacement Δt = elapsed time.Vavg = (vi + vf*)2Other Subject-wise Formulas Figure \(\PageIndex{1}\) Physics is more than calculating the momentum of billiard balls hitting each other or the friction acting on a speeding car's tires. Physics includes the study of practically every form of matter and how it interacts with other matter and with energy in various forms. The image shows one of several large parabolic antennas that NASA physicists used for years to communicate with ships and devices completing solar system exploration missions. What is physics? Physics is the branch of science that studies the physical world, including objects as small as subatomic particles and as large as galaxies. It studies the nature of matter and energy and how they interact. Physicists are inquisitive people who want to know the causes of what they see. How does the moon move? Why does the moon move? Why do the stars shine? Why do your hands get warm when you rub them together? Physicists, like all scientists, hope to find explanations that describe more than one phenomenon and offer a better understanding of how the universe works. People commonly believe that physics is all about solving word problems and memorizing equations. While it is true that many physics classes focus on the equations, it is important to remember that the purpose of physics is less about the problems and more about using equations, laws, and theories to understand the world we live in. Summary Physics is the branch of science that studies matter and energy and how they interact. Review Give your own definition of physics. What do you already know about physics? What do you think you know? Physics is all around us, all the time. Give a few examples of physics you have experienced. Use the resource below to answer the questions that follow. Why can't Hadfield dip the washcloth in a bag full of water? Pause the video at 1:55. What do you expect will happen as he wrings out the washcloth? What does the water do? Why? Video: Real World Application: Ollie Up Real World Application: Teen Uses Science to Make Water Safe Video: Video: LICENSED UNDER Physics is a fundamental branch of science that studies matter, its fundamental constituents, and its motion and behavior through space and time. Physics Formulas are very important during applications of various concepts of physics.In this article, we will cover all important formulas related to physics ranging from mechanics to electromagnetism as well as thermodynamics and quantum mechanics. List of All Physics Formula Below is the list of all important formulas related to physics:Physics FormulasFormulasFrequency FormulaF = v/λKinetic Energy Formula E = 1/2 mv2Ohm's Law Formula V = I × RPressure Formula P = F/AWeight Formula W = mgNewton's Second Law F = m × aPower Formula P = W/tDensity Formula P = m/VAcceleration Formula a = v - u/tAverage Speed Formula S = d/tPendulum Formula T = 2π√L/gFahrenheit Formula F = (9/5 × °C) + 32Work Formula W = F × d × cosθTorque FormulaT = F × r × sinθDisplacement FormulaΔX = Xf–XiMass FormulaF = m × a or m = F/aAmplitude Formula x = A sin (ωt + ϕ) Tension FormulaT = mg + maSurface Charge Density Formula σ = q / ALinear Speed Formula V(linear speed) = ΔS/ΔTPosition FormulaΔx = x2 − x1Heat of Fusion Formula q = m × ΔHFGravity Formula F α m1m2/r2Spring Potential Energy Formula P.E = 1/2 k × x2Physics Kinematics Formula v2 = vo2 + 2a(x - xo)DC Voltage Drop Formula V = I × RHubble's Law Formula v = HorInduced Voltage Formula e = – N(dΦB/dt)Latent Heat FormulaL = Q / MWavelength Formulaλ = v/fGravitational Force FormulaF = G(m1m2)/R2Potential Energy FormulaPE = mghStrain Energy FormulaU = Fδ / 2Friction Force Formulaf = μNCell Potential FormulaEcell = Ecathode − EanodeShear Modulus Formula(shear stress)/(shear strain) = (F/A)/(x/y) Water Pressure FormulaWater pressure = ρ g hRefractive Index Formulan = c/vCentroid FormulaC = [(x1 + x2 + x3)/ 3, (y1 + y2 + y3)/ 3]Mechanics FormulasFew important mechanics formulas are given below:Newton's Second Law of MotionF = m × a Where:F is the force applied to an object,m is the mass of the object,a is the acceleration of the object.Work-Energy TheoremW = ΔKEWhere:W is the work done on an object,ΔKE is the change in kinetic energy.Kinetic EnergyKE = 1/2mv2Where:KE is the kinetic energy,m is the mass of the object,v is the velocity of the object.Potential Energy (Gravitational)PE = mghWhere:PE is the potential energy,m is the mass,g is the acceleration due to gravity,h is the height.Hooke's Law (Spring Force)Fs = −kxWhere:Fs is the spring force,k is the spring constant,x is the displacement from the equilibrium position.Newton's Law of Universal GravitationF = G · m1 · m2 / r2Where:F is the gravitational force between two masses,G is the gravitational constant,m1 and m2 are the masses,r is the distance between the centers of the masses.Kinematics FormulasBelow are some important kinematics formulas:Displacement (s)s = ut + 1/2 at2Where:s is the displacement.u is the initial velocitya is the acceleration,t is the time.Final Velocity(v)v = u+ atWhere:v is the final velocity,u is the initial velocity,a is the acceleration,t is the time.Kinematic Third Equation of Motionv2 = u2 + 2asWhere:v is the final velocity,u is the initial velocity,a is the acceleration,s is the displacement.Average Velocity (v)v = Δx / ΔtWhere:v is the average velocity.Δx is the displacement.Δt is the time interval.Acceleration (a)a = Δv /ΔtWhere:a is the acceleration.Δv is the change in velocity.Δt is the time interval.Electricity FormulasFew important electricity formulas are given below:Electric Current (I)I = Q/tWhere:I is the electric current (measured in Amperes, A).Q is the charge that passes through a given point.t is the time taken.Electric Charge (Q)Q = I × tWhere:Q is the electric charge (measured in Coulombs, C).I is the electric current.t is the time taken.Ohm's LawV = IRWhere:V is the voltage,I is the current,R is the resistance.PowerP = VIWhere:P is the power,I is the current,V is the voltage.ResistanceR = ρl / A Where:R is the resistance,ρ is resistivity, l is length, and A is areaWatt's LawP = I²R or P = V²/RWhere:R is the resistance,I is Current, andV is VoltageElectric Energy P = W x Twhere:P is power, W is energy, and T is timeVoltageV = E / Q where E is energy, and Q is chargeElectromagnetism FormulasImportant Electromagnetism Formulas are given below:Electric Field (E)E = F/qWhere:E is the electric field.F is the force experienced by the charge.q is the magnitude of the charge.Faraday's Law of Electromagnetic Inductionε = dΦ/dtWhere:ε is the induced EMF.Φ is the magnetic flux through the loop.t is time.Magnetic Force on a Moving ChargeF = qvBsinθWhere:F is the magnetic force,q is the charge,v is the velocity,B is the magnetic field strength,θ is the angle between v and B.Gauss' Law for Electric FieldΦ = q/εoWhere:εo is the electric permittivity of free spaceΦ is the magnetic flux through the loop.q is the net charge enclosed by the surface.Electric Potential (Voltage)V = W/qWhere:V is the electric potential (voltage).W is the electric potential energy.q is the charge.Optics FormulasFew important optics formula are:Snell's Law (Refraction)n1 sinθ1 = n2 sinθ2Where:n1 incident indexn2 refracted indexθ1 incident angleθ2 refracted angleLens Formula1/f = 1/v - 1/uWhere:f is the focal length of the lens,u is the object distance,v is the image distance.Magnification for Lensesm = −v/uWhere:m is the magnification,v is the image distance,u is the object distance.Magnifying Power M = 1 + d/fWhere:M is the magnifying powerf is the focal distanced is the distance between the object and the lensThin Lens Formula1/f = 1/i + 1/oWhere:f is the focal length.i is the image distance.o is the object distance.Sound FormulasImportant sound formulas are given below:Speed of Soundv = √(B/p)Where:v is the speed of sound,B is the bulk modulus of the medium,ρ is the density of the medium.Wavelength (λ)λ = v/fWhere:λ is Wavelengthv is Speed of soundf is Frequency of the sound waveFrequency (f)f = v / λWhere:f is Frequencyv is Speed of soundλ is Wavelength Acoustic Impedance (Z)Z = ρ × cWhere:Z is Acoustic impedanceρ is Density of the mediumc is Speed of sound in the mediumFluid Mechanics FormulasFew important formulas related to fluid mechanics are:Densityρ = mVWhere:ρ is density of fluidm is mass, andv is volumePressureP = F/AWhere:P is the pressure of the fluid,F is applied Force,A is area Pressure at a Depth h in a Fluid of Constant Densityp = po + ρghwhere:p is pressure at height hpo is the pressure at the fluid's surface, ρ is the density of the fluid, g is the acceleration due to gravity, and h is the depth to which the object is submergedViscosityη = FL/vAWhere:η is fluid viscosityF is forceL is distance between the platesV is constant velocityA is area of the platePascal's LawF = PAWhere:F is applied ForceP is Pressure, andA is area under cross-section.Reynolds Number (Re)Re = pvL/μWhere:ρ is the density of the fluid.v is the velocity of the fluid.L is a characteristic length (e.g., diameter of the pipe).μ is the dynamic viscosity of the fluid.Thermodynamics formulasImportant thermodynamics formulas are illustrated below:First Law of Thermodynamics (Energy Conservation)ΔU = Q − WWhere:ΔU is the change in internal energy,Q is the heat added to the system,W is the work done by the system.Work Done in Isothermal Process (Ideal Gas)W = nRTln(Vf/Vi)Where:W is the work done,n is the number of moles of gas,R is the ideal gas constant,T is the temperature,Vf is the final volume,Vi is the initial volume.Heat Transfer (Constant Pressure)Q = nCp ΔTWhere:Q is the heat added or removed,n is the number of moles of gas,Cp is the specific heat at constant pressure,ΔT is the change in temperature.Ideal Gas LawPV = nRTWhere:P is the pressure of the gas.V is the volume of the gas.n is the number of moles of gas.R is the gas constant.T is the temperature of the gas.Entropy ChangeΔS = Q/TWhere:ΔS is the change in entropy.Q is the heat.T is the temperature.Gibbs Free EnergyΔG = ΔH − TΔSWhere:ΔG is the change in Gibbs free energy, ΔH is the change in enthalpy, ΔS is the change in entropy, and T is the absolute temperatureWave FormulasImportant formulas related to wave are described below:Wave Velocity (v)v = f × λWhere:v = Wave velocity (in meters per second, m/s)f = Frequency of the wave (in Hertz, Hz)λ = Wavelength of the wave (in meters, m)Frequency (f)f = 1/TWhere:f = Frequency (in Hertz, Hz)T = Time period of one wave cycle (in seconds, s)Wavelength (λ)λ = v/fWhere:λ = Wavelength (in meters, m)v = Wave velocity (in meters per second, m/s)f = Frequency (in Hertz, Hz)Period (T)T = 1/fWhere:T = Period (in seconds, s)f = Frequency (in Hertz, Hz)Intensity (I)I = P/Awhere:P is the power A is the area.Solved Examples on Physics FormulasExample 1: A stretched string has a displacement of 20 cm and a spring constant of 50Nm−1. Calculate the potential energy that the stretched string contains.Solution:The parameters that are given arek = 50Nm−1x is equal to 20 cm, or 0.2 m.Potential energy is what it will be.P.E. = 1/2 k × x2P.E =3/4 X 50 × (0.2)2P.E = 1 JExample 2: When x is in meters and t is in seconds, a body travels down the x-axis in accordance with the equation x = 1 - 2 t + 3t2. Determine the body's acceleration at t = 3s.Solution: As we havex = 1 - 2t + 3t2 then; Speed v = dx/dt = d(1 - 2t + 3t2)/dt = −2 + 6tNow Acceleration a = dv/dt = d(−2+6t)/dt = 6acceleration when t is 3s = 6 m/s2Example 3: Determine the weight of an item that weighs 50 kg on Earth.Solution: We know, weight = m × gw = (50 × 9.8) kg m/s2w = 490 NExample 4: A person travels in 10 seconds from Point A to Point B and returns in 8 seconds. Determine the person's average speed if the distance is 36 meters between A and B.Solution: This distance traveled in total is 36 + 36 = 72 meters.18 seconds was the total time taken.Thus, average speed is equal to the total distance traveled divided by total time.average speed = 72/18 = 4 m/s. Hence the average speed of the person is 4 m/s.Example 5: Determine the mass of an object having a kinetic energy of 100J and a velocity of 5 m/s.Solution: We know, KE = ½ mv2.100 = ½ x m x 5 x 5.100 = 25 m/2m = (100 × 2)/25 m = 8 kgPractice Problems Problems 1: Determine the displacement that an object traveling at a speed of 60 m/s will cover in 3 seconds. Problems 2: A 50 cm long, thin rod has an evenly distributed total charge of 5 mC over it. Determine the linear density of charges.Problems 3: A automobile with a mass of 250 kg is moving at a speed of 10 meters per second. What is the kinetic energy of it?Problems 4: 400kcal of heat is required for the phase transition of a 2 kilogram material. Calculate the heat it contains latently.Problems 5: A cube immersed in water with a side length of 0.1 meters and a density of 800 kg/m3. Determine if the cube will sink or float by computing the buoyant force acting on it. Learning Physics is all about implementing concepts & its derivations to solve the problems. Well, this article provides you exactly what you require to solve the physics problems. Physics Questions will always be challenging to students and it challenges your skills and physics knowledge. Some of the major tasks that students should face while solving the physics questions are Examine what numerical are given and asked in the problem, Applying the correct physics formula or equation, and Filling in the values and calculating properly. In order to get success in these types of challenges, everyone wants to have an adequate understanding of physics formulas along with its concepts. Hence, we are providing a comprehensive list of physics formulas in this article, which will act as an intermediary reference at the time of solving physics problems. Also, you can make use of this physics equations list as a quick revision before an exam. List of Physics Formulas & Equations Physics is the most basic subject of all sciences, and also it seems very harder to master. Basically learning physics is nothing but studying the basic laws which lead our universe. One can master in physics if they understand the theories thoroughly, and also they can easily identify the relation between the quantities or numbers by which they can form the formulas, derive it and learn simply. Students who are looking for physics formulas can grab the list from this page and utilize them to revise daily and before your exams. While memorizing the physics formulas, first of all, try to understand what a formula says and means, and then what physics relation it outlined. If you comprehend the physics topics underlying those formulas, deriving & memorize them will be easy for you. So, use the list of physics equations available over here and solve the basic physics problems very easily & quickly. 1) Average Speed Formula: The average speed is the average of speed of a moving body for the overall distance that it has covered. S = \( \frac{d}{t} \) Where, S Average Speed d Total distance traveled t Total time is taken 2) Acceleration Formula: Acceleration is defined as the rate of change in velocity to the change in time. It is denoted by symbol a. a =\( \frac{v-u}{t} \) where, a Acceleration v Final Velocity u Initial Velocity t Time taken 3) Density Formula: The density of material shows the denseness of it in a specific given area. \( \rho = \frac{m}{V} \) Where, ρ ρ Density m Mass of the body V The volume of the body 4) Newton's Second Law: According to Newton's second law of motion, the force can be expressed by the product of mass and acceleration of the body. F = m × a Where, F Force m Mass of the body a Acceleration in velocity available 5) Power Formula: The capacity to do some work is termed as Energy. The Energy spent to do work in a unit amount of time is termed as Power. P=\( \frac{W}{t} \) Where, P Power W Work done t Time taken 6) Weight Formula: Weight is not anything but the force which an object experiences due to gravity. W=mg Where, W Weight m Mass of the body g Acceleration due to gravity 7) Pressure

Formula: The pressure is defined as the amount of force applied per unit area of the object. $P=\frac{F}{A}$ Where, P Pressure F Force applied A Total Area of the object 8) Kinetic Energy formula: Kinetic energy is the energy that is possessed by a body due to its state of motion. $E = \frac{1}{2}mv^2$ Where, E Kinetic Energy m Mass of the body v The velocity with which the body is traveling 9) Ohms Law Formula: Ohms law says that the current running through some conductor material is directly proportional to the potential difference between two endpoints of the conductor. $V= I \times R$ Where, V Voltage measured in Volts I Electric current flowing through the conductor in amperes. R The resistance of the material in ohms. 10) Frequency Formula: Frequency is the revolutions completed per second or as the number of wave cycles. $f= \frac{V}{\lambda}$ Where, f Frequency of the wave V Velocity or wave speed λ λ The wavelength of the wave Final Words This is the list of some of the important physics formulas that are used by all class students mostly to solve physics problems. Every branch of physics theory is replaced with countless formulas. If you grasp the underlying theory behind the formulas then physics will be easier for you. So, don't just mug up the physics formulas mentioned here for the sake of exams, understand them, and relate them with every physics concept and be a creative student in your class. If you need Maths and Chemistry Formulas list to solve problems easily and score better marks in the final board exams, then visit our site and get an updated list of formulas and equations for better preparation. Frequently Asked Questions on Physics Formulas 1. Where can I find all the formulas of Physics? You can discover all major and commonly used physics formulas from the above list provided over here and whenever you need them, you can use them for free within no time. 2. What are the major formulas in physics? Basic Formulas in Physics are provided below for the sake of students. So, let us have a loot at them before solving the physics problems: $v=u+at$ $s=ut+1/2at^2$ $v^2-u^2=2as$ $F=ma$ P=force/area 3. How Can I learn Scientific Formulas? One of the finest ways to understand and learn the physics formulas is practicing & memorizing the derivation of the formula. Solve the example sums with the formula and read the formulas fluently in a day. Use the memory palace and jot down all the formulas in an understandable way and memorize them easily. 4. How to Memorize Physics Formulas? There are four three steps you should follow to memorize all physics formulas. They are as under Using Mnemonic Devices Understanding Each Formula Taking Care of Your Body 5. What are the tips to learn Physics Formulas? Below are furnished top tips to quickly learn several Physics formulas: Practice concentration Relax your brain Practice as much as you can Minimize your reference checks Understand the basic concept of the formula Keep away with all distractions Learn the derivation of every formula Use memorizing tricks