

PHYSICS MADE EASY - FUNCTIONALITY

for the TiNspire CX CAS – www.TiNspireApps.com

MECHANICS

Find Center of Mass
Read about Vectors
All in one Vector Explorer
Find Norm
All in one 2-Vectors Explorer
Read: Newton's 3 Laws of Motion
Newton's 2. Law: $F=m*a$
Centripetal Force: $F=m*v^2/r$
Centripetal Force: $F=\lambda*v^2*r$
Find Net Force/Resultant
Pressure
Pressure
Pressure
Friction Solver: $F=\mu*N$
Momentum: $p=m*v$
Momentum: $m1*v1=m2*v2$
Torque: $T=F*r*\sin(\lambda)$
Circular Motion: Velocity $v=2\pi r/t$
Circular Motion: Acceleration $a=v^2/r$
Projectile at Angle

KINEMATICS

Read: The Big 5 Equations
Average Speed=Distance/Time : $v=d/t$
Linear Motion: $vf^2=vo^2+2*a*d$
Linear Motion: $v=vo+a*t$
Linear Motion: $d=(vo^2+vf^2)/2 * t$
Linear Motion: $\lambda x=vo t + 1/2at^2$
Linear Motion: $v=v(2*g*h)$
Rotational Kinetic Energy $K=1/2*I*\lambda^2$
Harmonic Motion: $T=2\pi/\lambda$
Harmonic Motion: $E=1/2*k*A^2$
Harmonic Motion: $T=2\pi*v(l/g)$
Harmonic Motion: $f=1/T$
Harmonic Motion: $T=2*\pi*v(m/k)$
Harmonic Motion: $T=2*\pi*v(l/mgd)$
Harmonic Motion: $x=A*\cos(\lambda t+F)$
Harmonic Motion: $v=v(A^2-x^2)$
Harmonic Motion: Max Velocity
Harmonic Motion: Max Acceleration
Harmonic Motion: Read Formulas

Period of Spring $T=2\pi\sqrt{m/k}$ (mass/spring constant)
 Spring $F=kx$
 Potential Energy of Spring $U_s=1/2kx^2$
 Spring Time $T=2\pi\sqrt{m/k}$
 Time Frequency $T=1/f$
 Wave Length $\lambda=v/f$
 Time $T=2\pi\sqrt{m/k}$
 Waves+Vibrations: $v=v(T(m/L))$
 Waves+Vibrations: $k=2\pi/\lambda$
 Waves+Vibrations: $\lambda=2\pi f$

WAVES: LIGHT

Speed Of Light: $E=mc^2$
 Light $\sin(\theta_1)/\sin(\theta_2)=v_1/v_2$
 Light $\theta=\lambda/L$
 Light: $E=P/(4\pi r^2)$
 Light: $I_2=I_1\cos(\theta)^2$
 Light: $f_{obs}=f(1\pm v/c)$
 Light: $n=c/v$
 Light: $\lambda_{obs}-\lambda=\pm v/c\lambda$
 Light: $n_1\sin(\theta_1)=n_2\sin(\theta_2)$
 Light: $\sin(\theta)=n_1/n_2$
 Light: $n=c/v$
 Light: $1/f=1/d_1+1/d_2$
 Light: $M=h_i/h_o$
 Light: $\lambda=xd/L$
 Light Diffraction: $2x_1=(2\lambda L)/w$
 Light: $\lambda=d\sin(\theta)$
 Light: $x_{obj}=1.22\lambda L/D$

WAVES: OPTICS & SOUND

Optics: Read about Reflection
 Optics: Refraction: Refraction Index
 Optics: Refraction: Snell's Law
 Optics: Total Internal Reflection
 Optics: Wave Optics: Maxima
 Optics: Wave Optics: Minima
 Optics: Band Distance on Screen $\lambda/d=x/L$
 Optics: Read about Focal Points
 Optics: Optical Instruments: Focal Length
 Optics: Optical Instruments: Magnification
 Sound: Doppler Effect
 Sound: $I_b-I_a=1/2\lambda$
 Sound: $\beta=10\log(I_1/I_2)$
 Sound: $\lambda=v/f$
 Sound: $f_1=f/(1\pm s/c)$
 Sound: $v=v(B/\lambda)$

Sound: $\lambda P = \rho v \omega s_{\max}$
Sound: $l = \lambda P_{\max}^2 / (2 \rho v)$
Sound: $l = P / (4 \rho r^2)$

WAVES: FLUIDS

Fluids: $\lambda = m/V$
Fluids: $P = F/A$
Fluids: $F_2 = F_1 A_2 / A_1$
Fluids: $F_b = F_a r_b^2 / r_a^2$
Fluids: $P = P_0 + \rho h g$
Fluids: $F = \lambda V g$
Fluids: $\rho + (1/2) \lambda v^2 + \lambda g h = a$
Fluids: $D_s / D_i = h_{\text{sub}} / h_s$
Fluids: $Q = \rho r^4 (P_1 - P_2) / 8 \mu L$
Fluids: $T = F/L$
Fluids: $\lambda_1 A_1 v_1 = \lambda_2 A_2 v_2$

ENERGY

Kinetic: Translational
Kinetic: Rotational
 $E_{\text{pot}} = E_{\text{kin}} : \lambda x^2 = m/k v^2$
Potential Energy
Potential: Spring (Us)
Potential: Universal Gravitat. (UG)
Heat: $Q = m c \lambda T$
Heat: $Q = m L$
Heat: $W = \lambda P d \lambda V$
Heat: $\lambda E = Q - W$
Heat: Conduction
Heat: Convection
Heat: Radiation
Heat: $w = -n r t \ln(v_f / v_i)$
Miscellaneous: Heat (H)
Read Dissipated Energy
Miscellaneous: $W = F s \cos(\theta)$
Miscellaneous: $W = F s \sin(\theta)$
Miscellaneous: Power = W/t
Miscellaneous: $E = \mu dx$
Work Energy Theorem
Photon Energy: $E = h c / \lambda$

ELECTRICITY

Electricity & Induction
Electricity: Coulombs Law
Electricity: Voltage $V = E d$
Electricity: λ Voltage $\lambda V = W/q$
Electricity: $\lambda V = Q/C$

Electricity: $P = P_o [1 + a(T - T_o)]$
 Electricity: $q = Q \exp(-t/(RC))$
 Electricity: $q = Q(1 - \exp(-t/(RC)))$
 Electricity: $C = K \epsilon_o A/d$
 Electricity: $E = 1/2 C \lambda V^2$
 Electricity: $R = \lambda / A$
 Electricity: Flux $F = E \cdot A$
 Electricity: $E = Q / (4\pi r^2 \epsilon_o)$
 Electricity: $F = s \cdot Q / \epsilon_o$
 Electricity: $V = k \cdot q / r$
 Induction: $EMF = B(L)(V)$
 Induction: $I = V/R$
 Induction: $P_{ac} = 1/2(P_{acmax})$
 Induction: $P_{ac} = I_{eff}^2 R$
 Induction: $I_{eff} = v(1/2 I_{max}^2)$
 Induction: $V_{eff} = v(1/2(V_{max}^2))$
 Induction: $V_s/V_p = N_s/N_p$
 Induction: $V_p \cdot I_p = V_s \cdot I_s$

MAGNETISM

Magnetism: $F = q \cdot v \cdot B \cdot \sin(\theta)$
 Magnetism: $r = mv/(qB)$
 Magnetism: $v = E/B$
 Magnetism: $F = B \cdot I \cdot L \cdot \sin(\theta)$
 Magnetism: $N = T \cdot A \cdot m$
 Magnetism: $t = F \cdot r$
 Magnetism: $t = B \cdot I \cdot A \cdot \sin(\theta)$
 Magnetism: $t = B \cdot I \cdot A \cdot N \cdot \sin(\theta)$
 Magnetism: $B = \mu_o \cdot I / 2\pi r$
 Magnetism: $F/l = \mu_o \cdot I_1 \cdot I_2 / (2\pi d)$
 Magnetism: $B = \mu_o \cdot I / 2R$
 Magnetism: $B = N \cdot \mu_o \cdot I / 2R$
 Magnetism: $B = \mu_o \cdot N \cdot I / l$
 Magnetism: $F = B \cdot A \cdot \cos(\theta)$
 Magnetism: $\lambda F = BA(\cos\theta_f - \cos\theta_i)$
 Magnetism: $e = -N(\lambda F) / (\lambda t)$
 Magnetism: $F = I \cdot B \cdot l$
 Magnetism: $Emf = NBA \cdot \Delta \sin(\Delta t)$
 Magnetism: $Emf = -L(\lambda I) / (\lambda t)$
 Magnetism: $R = P \cdot l / A$

CIRCUITS & LAWS

Circuits & Laws: $P = V \cdot I$
 Circuits & Laws: $V = R \cdot I$
 Circuits & Laws: $P = I^2 \cdot R$
 Circuits & Laws: $P = V^2 / R$
 Circuits & Laws: $V_c = (V \cdot R_2) / (R_1 + R_2)$

Circuits & Laws: Read 1. Kirchhoff Law

Circuits & Laws: Read 2. Kirchhoff Law

PLANETS

Planets: Sun

Planets: Mercury

Planets: Venus

Planets: Earth

Planets: Moon

Planets: Mars

Planets: Jupiter

Planets: Saturn

Planets: Uranus

Planets: Neptune

Planets: Pluto

Gravitation & Orbits: $F = G \cdot m_1 \cdot m_2 / r^2$

Gravitation & Orbits: $v = \sqrt{G \cdot m / r}$

Gravitation & Orbits: $v = 2\pi r / t$

Gravitation & Orbits: $P_1^2 / P_2^2 = R_1^3 / R_2^3$

GAS LAWS

Volume of Gas

Boyle's Gas Law

Avogadro's Gas Law

Charles' Gas Law

GayLussac Gas Law

Combined Gas Law

Ideal Gas Law

Adiabatic Expansion of Ideal Gas Law

Gas Sum / Dalton Law

Graham's Gas Law

EXTRAS

Periodic Table of Elements: Symbol

Periodic Table of Elements: Element Name

Read: Useful Constants

Find Absolute Error and % Error

Convert: Normal to Scientific Notation & back

Density=Mass/Volume Solver

Moles & Representative Particles

Atoms to Moles Conversion

Relativity: Time-Dilation

Relativity: Mass-Dilation

SPECIFIC HEATS

Water
Ice
Steam
Methyl Alcohol
Benzene
Wood
Soil
Air
Aluminum
Marble
Glass
Iron/Steel
Copper
Silver
Mercury
Gold
Lead

HELP & ABOUT

Help & Use of Keys
What to Input
About us
Set FontSize