Pphys3T Cheat Sheet

by userunknown via cheatography.com/163016/cs/35106/

Mechanics

v = u + at

s = ½(u + v)t

$s = ut + ½at^2$

$v^2 = u^2 + 2as$

Power: P = Fv

Power: P = E/t

p = mv

Moment = Fd

ϱ=m/V

impulse: Ft = mv - mu

work done: W = Fcosθd

work done: W = Fd

Electris

V = IR

Q = It

P = VI

$P = I^2R$

$P = V^2/R$

$\mathscr{E}$ = I(R + r)

$\mathscr{E}$ = IR + Ir

$\mathscr{E}$ = V + Ir

$\mathscr{E}$ = E/Q

$\mathscr{E}1+\mathscr{E}2=V1+V2+V3$

W = VQ

W = $\mathscr{E}$Q

W = VIt

I = Anev

Capas

Q = CV

E = QV

$E = ½CV^2$

C = kR

C = (8.85x10-12)A/d

E = ½QV

crg: $Q = Q0(1-e^{-t/CR})$

discrg: $Q = Q0e^{-t/CR}$

Grav f

g=f/M

$F=GMm/r^2$

$g=-GM/r^2$

Egrav= -GMm/r

$T^2 \propto R^3$

$g \propto M$

$g \propto 1/r^2$

Vgrav= -GM/r

E = mVgrav

phys math

arc l = rθ

circum.cir = 2πr

$A.cir = \pi r^2$

cuved surf.A.cylnd = 2πrh

$s.A.sphe = 4\pi r^2$

A.trap = ½(a + b)h

$vol.cylnd = \pi r^2 h$

$vol.sphe = (4/3)\pi r^3$

$a^2 = b^2 + c^2$

cos: $a^2 = b^2 + c^2 – 2bccosA$

sine: a/sinA = b/sinB = c/sinC

$1eV = 1.60 \times 10^{-19}$ J

$1day = 8.64 \times 10^4$ s

$1year \approx 3.16 \times 10^7$ s

$1light\text{-}year \approx 9.5 \times 10^{15}$ m

$1parsec \approx 3.1 \times 10^{16}$ m

G: 6.67×10^{-11} Nm^2kg^{-2}

h: 6.63×10^{-34} Js

c: 3.00×10^8 ms^{-1}

e 1.60×10^{-19}C

CIruclar, SHM

springs

F = kx

E = ½fx

$E = ½kx^2$

Elec Field

E = F/Q

$F = kQ^2/r^2$

$E = kQ/r^2$

Euniform = V/d

V = kQ/r

$Energy = kQ^2/r$

mag: F = BILsinθ

mag: F = BQV

Parti

$E = mc^2$

E = hf

$eV = ½mv^2max$

$½mv^2max = hf - \Phi$

$E = hc/\lambda$

f0(thrsh) = Φ/h

Waves

v = fλ

T = 1/f

c = fλ

difrac:λ = dx/l

difrac-g:nλ = dsinθ

I=P/A

n = c/v

n1sinθ1=n2sinθ2

sinC = 1/n

nsinθ = k

λ = ax/D

θ<C:frac& par t.frec

θ=C:frac.o n.bound

θ>C:TIR

Math Math

$F_{centri\ peta} \pm mv^2/r$
$F = m\omega^2 r$
$\omega = 2\pi f$
$\omega = 2\pi/T$
$\omega = v/r$
$\omega = \theta/t$
$a = -\omega^2 x$
$a = v^2/r$
$T_{spring} = 2\pi\sqrt{m/k}$
$T_{pend} = 2\pi\sqrt{l/g}$
$E_{heat} = mc\Delta t$
$E_{elst} = Fx/2$

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