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## Physics Equation Sheet

Kinematics

vf = vi + at

Δx = vit + ½ at2

vf2 = vi2 + 2aΔx

Δx = ½ (vi+vf)t

Constant velocity:

xf = xi + vt

Δx = vavgt

Forces ΣF = ma

Fg= mg Fk= μk Fn

Fspring = kx Fs= μs Fn

Inclined Plane:

Fg **||** = mg sin θ Fg  = mg cos θ

Vector Components θ

vx = v cos θ vy = v sin θ

Momentum

p = mv Ft = Δp

pi + Δp = pf

m1v1*i* + m2v2*i* = m1v1*f* + m2v2*f*

Electricity

$$F\_{e}=\frac{kq\_{1}q\_{2}}{r^{2}}$$

$$E=\frac{F}{q}=\frac{kq\_{2}}{r^{2}}$$

V = IR

$$R\_{eq}=R\_{1}+ R\_{2 }+R\_{3 } $$

$$\frac{1}{R}\_{eq}= \frac{1}{R}\_{1} + \frac{1}{R}\_{2}+ \frac{1}{R}\_{3} $$

$$P=\frac{V^{2}}{R}=IV=I^{2}R $$

Work, Energy and Power

KE = ½ mv2

PEg = mgh

PEe = ½ kx2

W = Fdcosθ

P = W/t

Circular Motion and Gravitation





$$v=\frac{2πr}{T}$$



$$F\_{g}=\frac{Gm\_{1}m\_{2}}{r^{2}}$$

$$g=\frac{Gm\_{2}}{r^{2}}$$



Waves

$$v=λf $$

$$f\_{n}= \frac{nv}{2L} λ\_{n}=\frac{2L}{n} f\_{n}= \frac{nv}{4L} λ\_{n}=\frac{4L}{n}$$

$$n= \frac{c}{v} $$

$$n\_{i}\sin(θ\_{i}=)n\_{r}\sin(θ\_{r } )\sin(θ\_{c}=)\frac{n\_{r}}{n\_{i}}$$

$$\frac{1}{f}=\frac{1}{d\_{o}}+\frac{1}{d\_{i}} M=\frac{-d\_{i}}{d\_{o}} $$

Constants

G = 6.67 x 10 -11 N m2/kg2

rE = 6.36 x 106 m (Earth’s radius)

mE = 5.98 x 1024 kg (Earth’s mass)

k = 8.99 x 109 N m2/C2

qe = -1.6 x 10-19 C

me = 9.11 x 10-31 kg

mp = 1.67 x 10-27 kg

c = 3.0 x 108 m/s

g = 10 m/s2  (9.8 m/s2 for gravitation unit)