RJUHSD Physics Reference Sheet

Force and Energy

$F = ma$

$F = w = mg$

$F_g = \frac{Gm_1m_2}{d^2}$

$F = \frac{k_e q_1 q_2}{d^2}$

$F_c = ma_c = m\left(\frac{v^2}{r}\right)$

$\tau = F \cdot d$

$PE = mgh$

$KE = \frac{1}{2}mv^2$

$W = \Delta KE$

$W = F \cdot d$

$P = \frac{W}{t}$

F=force
m=mass
a =acceleration
w=weight
g=acceleration due to gravity
G=gravitational constant=6.67 $\times 10^{-11}$ $N \cdot m^2/kg^2$
d=distance
k_e= Coulomb's constant=8.99$\times 10^9$ $N \cdot m^2 \cdot C^{-2}$
q=charge
PE=Potential Energy
h=height
KE=Kinetic Energy
v=velocity
W=work
P=Power
τ =Torque

Motion

$s = \frac{\Delta d}{\Delta t}$

$a = \frac{\Delta v}{\nabla t}$

$\rho = mv$

$J = F\Delta t = m\Delta v$

$v = v_i + at$

$x = v_i t + \frac{1}{2}at^2$

$x = \left(\frac{v_i + v_f}{2}\right)t$

$v_f{}^2 = v_i{}^2 + 2ax$

s=speed
d=distance
t=time
a =acceleration
v=velocity
ρ =momentum
m=mass
J=impulse
F=Force
x=displacement

Kepler's Laws

$$e = \frac{f}{d}$$

$$T^2 \propto R^3$$

e=eccentricity
f=distance between foci of an ellipse
d=major axis length of an ellipse
T=orbital period
R=semi-major axis of an orbit

Waves

$$E = hf$$

$$v = f\lambda$$

$$v_{sound\ in\ air} = 331\ {}^{m}/_{s} + (0.6 \cdot T)$$

E=energy
h=Planck's constant= $6.626 \times 10^{-34}\ J \cdot s$
f =frequency
λ =wavelength
T=temperature in ${}^{0}C$

Experimental Design

$$Percent\ Error = \frac{\left|accepted\ value - experimental\ value\right|}{accepted\ value} \cdot 100$$

$$Percent\ Yield = \left[\frac{actual\ yield}{theoretical\ yield}\right] \cdot 100$$

Circuits

$$I = \frac{q}{t}$$

$$V = IR$$

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

I = current
q=charge
t=time
V=voltage
R=resistance
P=power