Formulas for chapters 3- 9

$$\bar{v} = \frac{\Delta d}{\Delta t} \qquad \Delta d = d_f - d_i \qquad \Delta t = t_f - t_i \qquad \bar{a} = \frac{\Delta v}{\Delta t}$$

$$\Delta v = v_f - v_i \qquad \Delta t = t_f - t_i \qquad \bar{v} = 1/2(v_f + v_i) \qquad v_f = v_i + at$$

$$d = v_i t + 1/2at^2 \qquad v_f{}^2 = v_i{}^2 + 2ad \qquad d = 1/2(v_f + v_i)t \qquad F = ma$$

$$\mathrm{F_f} = \mu \mathrm{F_N} \qquad \sin\theta = \frac{\mathrm{opp}}{\mathrm{hyp}} \qquad \tan\theta = \frac{\mathrm{opp}}{\mathrm{adj}} \qquad \cos\theta = \frac{\mathrm{adj}}{\mathrm{hyp}}$$

$$t = \frac{-2v_{yi}}{g} \qquad t = \sqrt{\frac{2y}{g}} \qquad \mathrm{v_x} = \mathrm{v_i}\cos\theta \qquad y_{\max} = \frac{-v_{yi}{}^2}{2g}$$

$$v_i{}^2 = \frac{-gx}{2(\sin\theta)(\cos\theta)} \qquad \mathrm{y} = \mathrm{v_{yi}t} + \frac{1}{2}\mathrm{gt}^2 \qquad \mathrm{v_{yi}} = \mathrm{v_i}\sin\theta \qquad v_{yi} = \frac{-gt}{2}$$

$$\mathrm{v} = \frac{2\pi\,\mathrm{r}}{\mathrm{T}} \qquad \mathrm{a_c} = \frac{4\pi^2\mathrm{r}}{\mathrm{T}^2} \qquad a_c = \frac{\mathrm{v}^2}{\mathrm{r}} \qquad F_c = ma_c$$

$$\mathrm{F}_c = \frac{m4\pi^2\,\mathrm{r}}{\mathrm{T}^2} \qquad \mathrm{F_c} = \frac{\mathrm{mv}^2}{\mathrm{r}} \qquad \mathrm{T} = \frac{1}{\mathrm{f}} \qquad T = 2\pi\sqrt{\frac{l}{g}}$$

$$\frac{\mathrm{T_a^2}}{\mathrm{r_a^3}} = \frac{\mathrm{T_b^2}}{\mathrm{r_b^3}} = \frac{4\pi^2}{Gm} \qquad \mathrm{Fg} = \frac{\mathrm{Gm_1m_2}}{\mathrm{r}^2} \qquad \Delta\rho = m\Delta v \qquad \mathrm{Ft} = \mathrm{m}\Delta\mathrm{v}$$

$$\rho_{sys} = \rho_a + \rho_b \qquad \rho'_{sys} = \rho'_a + \rho'_b \qquad v = \sqrt{\frac{Gm}{r}} \qquad T = 2\pi\sqrt{\frac{r^3}{Gm}}$$

Formulas for chapters 10- 12

$W = Fd$ $F = \frac{mv}{t}$ $W = F \cdot \cos\theta \cdot d$ $W = \frac{mv}{t}d$ $P = \frac{W}{t}$ $W = \Delta KE$ $Q = mC\Delta T$

$KE = \frac{1}{2}mv^2$ $PE = mgh$ $Q = mH_v$ $T_f = \frac{m_A C_A T_{i,A} + m_B C_B T_{i,B}}{m_A C_A + m_B C_B}$ $Q = mH_f$

Formulas for ch 14-18

$v = \lambda f$ $f' = f\left(\frac{v + v_d}{v - v_s}\right)$ $\frac{n_r}{n_i} = \frac{\sin\theta_i}{\sin\theta_r}$ $n = \frac{c}{v_{substance}}$

$\frac{1}{f} = \frac{1}{d_i} + \frac{1}{d_o}$ $d_i = \frac{d_o f}{d_o - f}$ $E = \frac{P}{4\pi d^2}$ $m = \frac{h_i}{h_o} = \frac{-d_i}{d_o}$

Formulas for ch 19-21

$\lambda = \frac{xd}{L}$ $\lambda = \frac{xW}{L}$ $F = \frac{kq_1q_2}{d^2}$ $V = Ed$ $V = \frac{W}{q}$

$E = \frac{F}{q'}$ $E = \frac{kq_1}{d^2}$ $C = \frac{q}{V}$

Formulas for ch 22-25

$V = IR$ $P = I^2R$ $P = IV$ $R = \frac{\rho L}{A}$ $\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R3} \ldots \frac{1}{R_n}$

$E = I^2Rt$ $F = \frac{qv}{L}$ $F = Bqv$ $F = BIL$ $E = Pt$

$EMF = Blv$ $I_{eff} = 0.707\ I_{max}$ $V_{eff} = 0.707\ V_{max}$

Constants and data:

Avogadro's number:	6.022×10^{23}	mass of Sun:	1.99×10^{30} kg
elementary charge:	-1.602×10^{-19} C	mass of Earth:	5.97×10^{24} kg
Coulomb's constant **K** :	9.00×10^{9} N•m^2/C^2	radius of Earth:	6.38×10^{6} m
univ grav constant **G**:	6.67×10^{-11} N•m^2/kg^2	radius of Earth orbit:	1.496×10^{11} m
speed of light in vacuum:	3.00×10^{8} m/s	period of Earth's orbit	3.16×10^{7} sec
Plank's constant :	6.626×10^{-34} J•s	mass of Moon:	7.36×10^{22} kg
atomic mass unit :	1.661×10^{-27} kg	radius of Moon's orbit	3.80×10^{8} m
energy conversion =	931.49 MeV/amu	period of Moon's orbit	2.36×10^{6} sec
mass of electron:	9.109×10^{-31} kg	mass of Saturn	5.67×10^{26} kg
mass of proton:	1.673×10^{-27} kg or 1.007825 amu	radius of Saturn's orbit	1.43×10^{12} m
mass of neutron:	1.6754×10^{-27} kg or 1.008665 amu	period of Saturns orbit	9.30×10^{8} sec