PHYSICS 12 ~ FORMULA SHEET

$v = \frac{\Delta d}{\Delta t}$	$v_{ave} = \frac{v_1 + v_2}{2}$	$a = \frac{\Delta v}{\Delta t}$	$a_c = \frac{v^2}{r} = 4\pi^2 r f^2 = \frac{4\pi^2 r}{T^2}$
$\Delta d = v_2 \Delta t - \frac{1}{2} a (\Delta t)^2$	$v_2{}^2 = v_1{}^2 + 2a\Delta d$	$\Delta d = v_1 \Delta t + \frac{1}{2} a (\Delta t)^2$	$v = \frac{2\pi r}{T}$
$F_g = mg$	$F_f = \mu F_N$	$F_{net} = ma$	$F_c = \frac{mv^2}{r} = \frac{4\pi^2 mr}{T^2}$
$p = mv$	$F\Delta t = m\Delta v$	$W = F\Delta d \cos\theta$	$K = \frac{r^3}{T^2}$
$\Delta t = \frac{2v\sin\theta}{g}$	$\Delta d_h = \frac{v^2 \sin 2\theta}{g}$	$H = \frac{v^2 \sin^2\theta}{2g}$	$\tau = rF\sin\theta$
$E_k = \frac{1}{2} mv^2$	$E_g = mg\Delta h$	$F_a = kx$	$E_e = \frac{1}{2} kx^2$
$F_g = \frac{Gm_1 m_2}{r^2}$	$\lvert\vec{g}\rvert = \frac{\lvert\vec{F}_g\rvert}{m}$	$\lvert\vec{g}\rvert = \frac{Gm}{r^2}$	$T = 2\pi\sqrt{\frac{l}{g}}$
$F_Q = \frac{kq_1 q_2}{r^2}$	$\lvert\vec{E}\rvert = \frac{\lvert\vec{F}_Q\rvert}{q}$	$\lvert\vec{E}\rvert = \frac{kq}{r^2}$	$T = 2\pi\sqrt{\frac{m}{k}}$
$F_m = BIl\sin\theta$ $F_m = Bqv\sin\theta$	$\frac{I_s}{I_p} = \frac{V_p}{V_s} = \frac{N_p}{N_s}$	$P = IV$	$V = \frac{\Delta E}{q}$
$E_k = hf - W$	$p = \frac{h}{\lambda}$	$\lambda = \frac{h}{mv}$	$E_n = \frac{-13.6eV}{n^2}$

Mathematical Tools

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$c^2 = a^2 + b^2 - 2ab\cos C$	$\frac{a}{\sin A} = \frac{b}{\sin B}$

Constants

$g = 9.81\ m/s^2$ (near the Earth's surface)	$m_{sun} = 1.98 \times 10^{30}$ kg
$k = 9.0 \times 10^9\ N\ m^2/C^2$	$m_{earth} = 5.98 \times 10^{24}$ kg
$e = 1.6 \times 10^{-19}\ C$	$r_{earth} = 6.38 \times 10^6$ m
$K_{sun} = 3.35 \times 10^{18}\ m^3/s^2$	$r_{earth's\ orbit} = 1.49 \times 10^{11}$ m
$c = 3.00 \times 10^8$ m/s	$m_{moon} = 7.34 \times 10^{22}$ kg
$1eV = 1.6 \times 10^{-19}$ J	$r_{moon} = 1.74 \times 10^6$ m
$m_{proton} = 1.67 \times 10^{-27}$ kg	$r_{moon's\ orbit} = 3.8 \times 10^8$ m
$m_{electron} = 9.11 \times 10^{-31}$ kg	$T_{moon} = 2.36 \times 10^6$ s
$h = 6.63 \times 10^{-34}$ J s	$G = 6.67 \times 10^{-11}\ N\ m^2/kg^2$

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