H160 Constants & Basic Formulae

k = kilo = 10^3	$G = 6.67 \times 10^{-11}$ m^{3}kg^{-1}s^{-2}	$h = 6.63 \times 10^{-34}$ Js	1 AU = 1.5×10^7 km
M = mega = 10^6	m = milli = 10^{-3}	$\sigma = 5.65 \times 10^{-34}$ W/m^2/K^4)	1 ly = 9.5×10^{12} km
n = nano = 10^{-9}	$c = 3 \times 10^8$ m/s	$k = 1.38 \times 10^{-23}$ J/K	1 pc = 3.26 ly

Formula	Name
$\alpha = \frac{s}{d} 57.3°$	*small angle formulae*
$p^2 = a^3$	*Kepler's 3rd law*
$v = \frac{\Delta x}{\Delta t}$	*velocity*
$a = \frac{\Delta v}{\Delta t}$	*acceler-ation*
$net\ F = ma$	*Newton's 2nd law*
$p = mv$	*momentum*
$L = mvr$	*angular momentum*
$KE = \frac{1}{2} mv^2$	*kinetic energy*
$E = mc^2$	*mass energy*
$F = G\frac{M_1 M_2}{d^2}$	*gravity*
$a^3 = \frac{G}{4\pi^2}(M_1 + M_2) p^2$	*Newton's form Kepler's 3rd*
$a^3 = (M_1 + M_2) p^2$	*Stellar Astronomer's form*
$v_{orbit} = \sqrt{\frac{GM}{R}}$	*orbital velocity*
$v_{escape} = \sqrt{\frac{2GM}{R}}$	*escape velocity*
$PV = NkT$	*ideal gas law*
$D = \frac{m}{V}$	*density*
$c = \lambda f$	*wave equation*
$E = hf = \frac{hc}{\lambda}$	*photon energy*
$flux = \sigma T^4$	*radiation law #1*
$\lambda_{\max} = \frac{2.9 \times 10^6}{T}(nmK)$	*radiation law #1*
$v_{rad} = \frac{\lambda_{shift} - \lambda_{rest}}{\lambda_{rest}} c$	*Doppler shift*
$\frac{LGP_A}{LGP_B} = \frac{diam_A{}^2}{diam_B{}^2}$	*light gathering power*
$\alpha = 2.5 \times 10^5\,'' \frac{\lambda}{D}$	*resolving power*
$\gamma = \frac{1}{\sqrt{1 - v^2/c^2}}$	*relativity gamma*
$t_{move} = \frac{t_{rest}}{\gamma}$	*relativity time*
$l_{move} = \frac{l_{rest}}{\gamma}$	*relativity length*
$m_{move} = m_0 \gamma$	*relativity mass*
$\Delta x \Delta p \le \frac{h}{4\pi}$	*uncertainty in x & p*
$\Delta E \Delta t \le \frac{h}{4\pi}$	*uncertainty E and t*
$\frac{\partial^2 \Psi}{\partial x^2} + \frac{8\pi^2 m}{h^2}(E - V) = 0$	*Schrodinger equation*
$d(pc) = \frac{1}{p''}$	*distance parallax*
$b = \frac{L}{4\pi d^2}$	*apparent brightness*
$L = 4\pi d^2 b$	*luminosity #1*
$L = 4\pi R^2 \sigma T^4$	*luminosity #2*
$m - M = 5\log\left(\frac{d}{10}\right)$	*distance #1*
$d = 10^{\left(\frac{m-M+5}{5}\right)}$	*distance #2*
$(M_A + M_B) = \frac{a^3}{p^2}$	*star masses*