Gravitation

Notation	Equation
Gravitational Force's Magnitude	$F = G\frac{m1m2}{r^2}$
Gravitational Constant G	$G = 6,67 * 10^{-11}\frac{Nm}{kg^2} = 6,67 * 10^{-11}\frac{m^3}{kg * s^2}$
Principle of Superposition	$\vec{F_{1,net}} = \vec{F_{1,2}} + \vec{F_{1,3}} + ... + \vec{F_{1,n}} = \sum_{i=2}^{n} \vec{F_{1,i}}$
P.o.S on a Extended Real Object	$\vec{F_1} = \int d\vec{F}$
Newton's Second Law	$F = ma_g$
Gravitational Acceleration	$a_g = \frac{GM}{r^2}$
Newton's Second Law for Forces along r axis	$F_N - ma_g = -m(\omega^2 R)$
Free-Fall Acceleration (Near Eearth's Surface)	$g = a_g - \omega^2 R$
Gravitational Force Inside Earth	$F = \frac{GmM}{R^3} r$
Gravitational Potential Energy 2-particles	$U = -\frac{GMm}{r}$
Gravitational Potential Energy mul-particles	$U = -(\frac{Gm_1m_2}{r_{12}} + \frac{Gm_1m_3}{r_{13}} + \frac{Gm_2m_3}{r_{23}} ...)$
Change Gravitational Potential Energy(Path Indep.)	$\Delta U = U_f - U_i = -W$
Escape Speed	$v = \sqrt{\frac{2GM}{R}}$