ΤΥΠΟΛΟΓΙΟ ΦΥΣΙΚΗΣ Ι

Σταθερές – Γενικά			
$g = 9.81\ m/s^2$	$c = 3\times10^8\ m/s$	$G = 6.67\times10^{-11}\ Nm^2/Kg^2$	$\rho_{\nu\epsilon\rho o\acute{u}} = 1000\ Kg/m^3$
$S_{sphere} = 4\pi R^2$	$V_{sphere} = (4/3)\pi R^3$	$V_{cyl} = \pi R^2 h$	$V_{cone} = (1/3)\pi R^2 h$
$\vec{r} = x\hat{\imath} + y\hat{\jmath} + z\hat{k}$	$\hat{r} = \vec{r}/\lvert r\rvert\ ,\ \lvert\hat{r}\rvert = 1$	$r^2 = \lvert\vec{r}\rvert^2 = x^2 + y^2 + z^2$	

Κινηματική – Δυναμική			
$\vec{r}\,(t) = x(t)\hat{\imath} + y(t)\hat{\jmath} + z(t)\hat{k}$	$\vec{v}\,(t) = \frac{d\vec{r}(t)}{dt} = \frac{dx(t)}{dt}\hat{\imath} + \frac{dy(t)}{dt}\hat{\jmath} + \frac{dz(t)}{dt}\hat{k}$		$\vec{a}\,(t) = \frac{d\vec{v}(t)}{dt}$
$\vec{a} = \vec{a}_T + \vec{a}_N = \hat{u}_T\frac{dv}{dt} + \hat{u}_N\frac{v^2}{\rho}$	$a_N = v^2/\rho$	$\vec{v} = \vec{\omega}\times\vec{r}$	$\omega = \frac{d\theta}{dt}$
$\vec{F} = \frac{d\vec{p}}{dt} = m\frac{d\vec{v}}{dt} = m\frac{d^2\vec{r}}{dt^2}$	$F_N = ma_N = m\,v^2/\rho$	$\vec{p} = m\vec{v} = m\frac{d\vec{r}}{dt}$	$\vec{\tau} = \vec{r}\times\vec{F}$
$F_{tot} = \frac{dp}{dt} = M\frac{dv}{dt} + v_{rel}\frac{dM}{dt}$	$F_{\tau\rho\iota\beta\acute{\eta}\varsigma} = \mu N$	$D = \frac{1}{2}C\rho A v^2$	

Ειδική Θεωρία Σχετικότητας			
$\beta = v/c\ ,\ \ \gamma = \frac{1}{\sqrt{1-\beta^2}}$	$x' = \gamma(x - vt)$	$t' = \gamma\left(t - \frac{vx}{c^2}\right)$	$u'_x = \frac{u_x - v}{1 - \frac{u_x v}{c^2}}$
$E = \gamma E_0 = \gamma mc^2$	$E = K + E_0$	$p = \gamma mv$	$E^2 = (pc)^2 + (mc^2)^2$

Έργο – Ενέργεια – Δυναμικό		
$W = \int dW = \int F(\vec{r})d\vec{r}$	$dW = \vec{F}d\vec{r} = F_x dx + F_y dy + F_z dz$	$N = \frac{dW}{dt} = \vec{F}\vec{v}$
$F(x) = -\frac{dU}{dx}$	$\vec{F} = -\vec{\nabla}U = -\left(\frac{\partial U}{\partial x}\hat{\imath} + \frac{\partial U}{\partial y}\hat{\jmath} + \frac{\partial U}{\partial z}\hat{k}\right)$	$E_{tot} = K + U$

Κέντρο Μάζας – Ροπή Αδράνειας – Στερεό Σώμα – Ταλαντώσεις			
$\vec{r}_{CM} = \frac{\int_M \vec{r}dm}{\int_M dm}$	$I = \int_M r^2 dm$	$I = I_C + Mr^2$	$\vec{L} = I\vec{\omega}$
$\vec{\tau} = \frac{d\vec{L}}{dt} = I\frac{d\vec{\omega}}{dt}$	$L_{cyc} = mr^2\omega$	$K_{rot} = \frac{1}{2}I\omega^2$	$K_{tot} = K_{rot} + \frac{1}{2}Mv^2$
$\vec{F}(\vec{r}) = -k\vec{r} = -m\omega^2\vec{r}$	$T = \frac{1}{f} = \frac{2\pi}{\omega} = 2\pi\sqrt{\frac{m}{k}}$	$\frac{d^2x}{dt^2} + \omega^2 x = 0$	$x = A\cos(\omega t)$

Βαρύτητα		Ρευστομηχανική	
$\vec{F}_B = G\frac{mM}{r^2}\hat{r}\ ,\ \ \hat{r} = \vec{r}/\lvert r\rvert$	$U(r) = -G\frac{mM}{r}$	$P = P_0 + \rho gh$	$F_{\alpha\nu} = m_f g = V_f\rho_f g$
$L = mr^2\frac{d\theta}{dt} = const$	$T^2 = \left(\frac{4\pi^2}{GM}\right)r^3$	$A_1 v_1 = A_2 v_2$	$P + \frac{1}{2}\rho v^2 + \rho gh = C$