PHY 1053 and 1054 Formula sheet

$S = S_0 + v_0 t + \frac{1}{2}at^2$ $F_{net} = ma$ $a_c = \frac{v^2}{r}$ $W_{total} = \Delta K$

$W = Fdcos\theta$ $\vec{J} = \vec{F}\Delta t = \Delta\vec{p}$ $\omega = \alpha t + \omega_0$ $a = r\alpha$

$v = r\omega$ $\tau = F_{perp}l$ $\sum\tau = I\alpha$ $v = \lambda f$

$x = A\cos(\omega t)$ $v = -\omega A\sin(\omega t)$ $a = -\omega^2 A\cos(\omega t)$ $\frac{F_1}{A_1} = \frac{F_2}{A_2}$

$P_0 A - \rho A - \rho ghA = 0$ $P + \rho g + \frac{1}{2}\rho v^2 = constant$ $L = L_0(1 + \alpha\Delta T)$ $V = V_0(1 + \beta\Delta T)$

$Q = mc\Delta T$ $Q = Lm$ $PV = nRT$ $W = P\Delta V$

$W = nRT\ln(\frac{V_2}{V_1})$ $\Delta U = -W$ $\Delta U = Q$ $p(V_2 - V_1) = W$

$P_1V_1^\gamma = P_2V_2^\gamma$ $T_1V_1^{\gamma-1} = T_2V_2^{\gamma-1}$ $e = \frac{W}{Q_H} = 1 - |\frac{Q_c}{Q_H}|$

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$F = \frac{kq_1q_2}{r^2}$	$E = \frac{k\|q\|}{r^2}$	$\varphi_E = EA\cos\theta$	$W = qEd$
$E = \frac{Q}{\epsilon_0 A}$	$\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2}$	$C = C_1 + C_2$	$R = R_1 + R_2$
$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$	$V = IR$	$P = IV = I^2R$	$F = \|q\|vB\sin\theta$
$F = IlB\sin\theta$	$\tau = NIAB\sin\theta$	$B = \frac{\mu_0 I}{2\pi r}$	$\varphi = BA\cos\theta$
$\varepsilon = \omega AB\sin(\omega t)$	Junction: $I_{in} = I_{out}$	Loop: sum of V in loop =0	
$I = \frac{1}{2}\epsilon_{0c}E_{max}^2$	$\frac{\sin\theta_a}{\sin\theta_b} = \frac{n_b}{n_a}$	$\frac{1}{s} + \frac{1}{s'} = \frac{1}{f}$	$m = \frac{y'}{y} = \frac{s'}{s}$
$\frac{1}{f} = (n-1)(\frac{1}{R_1} - \frac{1}{R_2})$	$r_2 - r_1 = (m + \frac{1}{2})\lambda$	$y_m = R\frac{m\lambda}{d}$	$d\sin\theta = m\lambda$

Momentum is conserved in all collisions; Energy is conserved in elastic collisions.

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