Formulas
(you need very few of these!!)

<table>
<thead>
<tr>
<th>Formula</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$v_{avg} = \frac{\Delta l}{\Delta t}$</td>
<td>Average velocity</td>
</tr>
<tr>
<td>$a_{avg} = \frac{\Delta v}{\Delta t}$</td>
<td>Average acceleration</td>
</tr>
<tr>
<td>$s = v_0t + \frac{1}{2}at^2$</td>
<td>Position equation</td>
</tr>
<tr>
<td>$v_f = v_i + at$</td>
<td>Velocity equation</td>
</tr>
<tr>
<td>$v_f^2 = v_i^2 + 2as$</td>
<td>Second position equation</td>
</tr>
<tr>
<td>$s = \frac{1}{2}(v_i + v_f)t$</td>
<td>Distance equation</td>
</tr>
<tr>
<td>$\sin = \frac{o}{h}$</td>
<td>Trigonometric function</td>
</tr>
<tr>
<td>$\cos = \frac{a}{h}$</td>
<td>Trigonometric function</td>
</tr>
<tr>
<td>$\tan = \frac{o}{a}$</td>
<td>Trigonometric function</td>
</tr>
<tr>
<td>$\tan 45^\circ = 1$</td>
<td>Trigonometric function</td>
</tr>
<tr>
<td>$\sin 30^\circ = 0.5 = \cos 60^\circ, \cos 30^\circ = 0.866 = \sin 60^\circ$</td>
<td>Trigonometric function</td>
</tr>
<tr>
<td>$\sin 45^\circ = 0.707$</td>
<td>Trigonometric function</td>
</tr>
<tr>
<td>$\cos 45^\circ = 0.707$</td>
<td>Trigonometric function</td>
</tr>
<tr>
<td>$g = 10 \frac{m}{s^2}$</td>
<td>Acceleration due to gravity</td>
</tr>
<tr>
<td>1in = 2.5cm</td>
<td>Conversion factor</td>
</tr>
<tr>
<td>$2\pi \text{ rad} = 360^\circ$</td>
<td>Angular conversion</td>
</tr>
<tr>
<td>$x = \frac{\Delta b \pm \sqrt{b^2 - 4ac}}{2a}$</td>
<td>Quadratic formula</td>
</tr>
<tr>
<td>$F = m\ddot{a}$</td>
<td>Force equation</td>
</tr>
<tr>
<td>$f_s = \Delta s N$</td>
<td>Static friction</td>
</tr>
<tr>
<td>$f_k = \Delta k N$</td>
<td>Kinetic friction</td>
</tr>
<tr>
<td>$a_c = \frac{v^2}{r}$</td>
<td>Centripetal acceleration</td>
</tr>
<tr>
<td>$F_g = mg$</td>
<td>Gravitational force</td>
</tr>
<tr>
<td>$F_g = \frac{GMm}{r^2}$</td>
<td>Gravitational force</td>
</tr>
<tr>
<td>$\ddot{p} = m\ddot{v}$</td>
<td>Mass equation</td>
</tr>
<tr>
<td>$v_{1f} = \frac{m_1 \Delta m_2 v_{1i}}{m_1 + m_2}$</td>
<td>Momentum equation</td>
</tr>
<tr>
<td>$v_{2f} = \frac{2m_1}{m_1 + m_2}v_{1i}$</td>
<td>Momentum equation</td>
</tr>
<tr>
<td>$C = 2\pi r$</td>
<td>Cylinder surface area</td>
</tr>
<tr>
<td>$A_{cylinder} = \pi r^2 h$</td>
<td>Cylinder volume</td>
</tr>
<tr>
<td>$V = \frac{4}{3}\pi r^3$</td>
<td>Sphere volume</td>
</tr>
<tr>
<td>$A_{sphere} = 4\pi r^2$</td>
<td>Sphere surface area</td>
</tr>
<tr>
<td>$A = \pi r^2$</td>
<td>Circle area</td>
</tr>
<tr>
<td>$s = \sqrt{l}$</td>
<td>Length</td>
</tr>
<tr>
<td>$v =</td>
<td>\vec{r}</td>
</tr>
<tr>
<td>$a =</td>
<td>\vec{r}</td>
</tr>
<tr>
<td>$T = \frac{1}{f} = 2\pi$</td>
<td>Period</td>
</tr>
<tr>
<td>$\omega = \sqrt{l + \frac{1}{2}l^2}$</td>
<td>Angular velocity</td>
</tr>
<tr>
<td>$L = l^2 + \frac{1}{2}l$</td>
<td>Angular momentum</td>
</tr>
<tr>
<td>$\omega^2 = \frac{1}{l} + 2\omega$</td>
<td>Angular momentum</td>
</tr>
<tr>
<td>$L = I\dot{\omega}$</td>
<td>Angular momentum</td>
</tr>
<tr>
<td>$I = m_i R_i^2$</td>
<td>Moment of inertia</td>
</tr>
<tr>
<td>$I_{hoop} = MR^2$</td>
<td>Moment of inertia</td>
</tr>
<tr>
<td>$I_{disk} = \frac{1}{2}MR^2$</td>
<td>Moment of inertia</td>
</tr>
<tr>
<td>$I_{sphere} = \frac{2}{5}MR^2$</td>
<td>Moment of inertia</td>
</tr>
<tr>
<td>$\omega = Fr_{\omega}$</td>
<td>Angular momentum</td>
</tr>
<tr>
<td>$W = Fd\cos\theta$</td>
<td>Work</td>
</tr>
<tr>
<td>$KE = \frac{1}{2}mv^2$</td>
<td>Kinetic energy</td>
</tr>
<tr>
<td>$KE = \frac{1}{2}I\omega^2$</td>
<td>Kinetic energy</td>
</tr>
<tr>
<td>$\omega = I\omega$</td>
<td>Angular momentum</td>
</tr>
<tr>
<td>$U_g = mgh$</td>
<td>Potential energy</td>
</tr>
<tr>
<td>Equation</td>
<td>Equation</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>$P_0 + \frac{1}{2} v^2 + gh = \text{const.}$</td>
<td>$Av = \text{const.}$</td>
</tr>
<tr>
<td>$y = y_{\text{max}} \cos \theta t$</td>
<td>$\theta = \frac{2\theta}{T} = 2\theta'$</td>
</tr>
<tr>
<td>$\theta = \sqrt{\frac{g}{L}}$</td>
<td>$v = f\theta = \frac{\theta}{T}$</td>
</tr>
<tr>
<td>$L = L_0 \sqrt{\theta T}$</td>
<td>$V = V_0 \sqrt{\theta T}$</td>
</tr>
<tr>
<td>$Q = cm(T_f - T_i)$</td>
<td>$Q = Lm$</td>
</tr>
<tr>
<td>$pV = nRT$</td>
<td>$N_A = 6.02 \times 10^{23} \text{ mol}$</td>
</tr>
<tr>
<td>$1 \text{ cal} = 4.186 \text{ J}$</td>
<td>$Q = 1 \int \frac{Q_c}{Q_h} = 1 \int \frac{T_c}{T_h}$</td>
</tr>
</tbody>
</table>