IB Physics Formula Sheet (SL & HL)

Mechanics

- $v = u + at$
- $s = ut + 1/2\ at^2$
- $v^2 = u^2 + 2as$
- $F = ma$
- $p = mv$
- $KE = 1/2\ mv^2$
- $Work = Fd\ \cos\theta$

Thermal Physics

- $Q = mc\Delta T$ (Specific Heat)
- $Q = mL$ (Latent Heat)
- $pV = nRT$ (Ideal Gas Equation)

Waves

- $v = f\lambda$
- $n = c/v$
- Snell's Law: $n_1 \sin\theta_1 = n_2 \sin\theta_2$

Electricity & Magnetism

- $V = W/q$
- $I = Q/t$
- $V = IR$
- $P = VI$
- $F = BIL \sin\theta$

Circuits

- R_total(series) = R1 + R2 + ...
- 1/R_total(parallel) = 1/R1 + 1/R2 + ...
- $Q = It$

SHM (Simple Harmonic Motion)

- $x = A \cos(\omega t)$

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- $T = 2\pi\sqrt{(m/k)}$
- $T = 2\pi\sqrt{(l/g)}$

Rotation

- $\tau = rF \sin\theta$
- $L = I\omega$
- $KE_{rot} = 1/2\ I\omega^2$

Gravitation

- $F = Gm_1m_2/r^2$
- $g = GM/r^2$
- $Ep = -GMm/r$

Modern Physics

- $E = mc^2$
- $E = hf$
- $\lambda = h/p$

Quantum & Atomic

- $E = hf$
- $E = -13.6\ eV\ (1/n^2)$
- $\lambda = h/p$

Radioactivity

- $N = N0\ e^{(-\lambda t)}$
- $A = \lambda N$
- $T½ = \ln 2/\lambda$

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