SPH4U Formulas and Constants

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| **Kinematics** | **Dynamics** | **Energy and Momentum** | **Fields** | **Light** |  |
| *ac* = 4π2*rf* 2  **Special Relativity** |  | *W* = *F*Δ*d* cos*θ*  *W* = Δ*E*    *Eg* = *mg*Δ*h* | Δ*E*E = – *qε*Δ*d*      *F*M = *qvB* sin *θ*  *F*on wire=*ILB*sin*θ* | |*PmS*1 – *PmS*2| = *m*λ  *d* sin *θm* = *m*λ        *I*out = *I*in cos2 *θ*      *n*1 sin *θ*1 = *n*2 sin *θ*2 | G = 6.67 × 10 – 11 N⋅m2/kg2  *k* = 8.99 × 109 Nm2/C2  *e* = – 1.60 × 10– 19 C  *me*=9.11 × 10–31 kg  *mp*=1.67 × 10–27 kg  *mEarth* = 5.98 ×1024 kg  *rEarth* = 6.38 × 106 m  *n*air = 1.0003  *n*water = 1.33  *c* = 3.0 × 108 m/s  *Wavelength (nm)*  Violet: 400 – 450  Blue: 450 – 500  Green: 500 – 570  Yellow: 570 – 590  Orange: 590 – 610  Red: 610 – 750 |