POSSIBLY USEFUL INFORMATION

Conversions and Constants:

1000 m = 1 km 100 cm = 1 m 1000 mm = 1 m 1 mL = 1 cm^3

1 Newton (N)= 1 $\frac{\text{kg}\cdot\text{m}}{\text{s}^2}$ 1 Joule (J) = 1 $\text{N}\cdot\text{m}$ 1 Watt (W) = 1 $\frac{\text{J}}{\text{s}}$

$g = 10\frac{\text{m}}{\text{s}^2}$ $G = 6.67\times10^{-11}\frac{\text{N}\cdot\text{m}^2}{\text{kg}^2}$ Δ = "change in…"

Mechanics:

Position / Path / Displacement $\Delta x = x_{final} - x_{initial}$

Average Speed / Average Velocity $s_{ave} = \frac{\text{Path}}{\text{Time}}$ $v_{ave} = \frac{\text{Displacement}}{\text{Time}} = \frac{\Delta x}{\Delta t}$

Average acceleration / Free Fall ($a = g$) $a_{ave} = \frac{\Delta v}{\Delta t}$ $v = at$ $d = \frac{1}{2}at^2$

Inertia / Forces / Weight / Mass $F_{net} = ma$ Weight = mg

Momentum / Impulse $p = mv$ $\Delta p = \Delta(mv) = F\Delta t$

Conservation of Momentum / Collisions $p_{final} = p_{initial}$ (for a system)

Kinetic Energy /Gravitational Potential Energy $KE = \frac{1}{2}mv^2$ $GPE = mgh$

Energy / Conservation of Energy $E = KE + GPE$ $E_{final} = E_{initial}$

Work / Power $W = (F_{parallel})\Delta x = \Delta KE$ $P = \frac{\Delta E}{\Delta t}$

Centripetal Force / Torque $F = \frac{mv^2}{r}$ $\tau = (F_{perpendicular})\times d = F\times(\text{Lever Arm})$

Universal Gravitation $F = \frac{Gm_1m_2}{d^2}$ $g = \frac{GM}{d^2}$ $F = \frac{Gm_1m_2}{d^2}$

Projectile/Satellite Motion $d_v = \frac{1}{2}gt^2$ $d_h = v_ht$ $T^2 = \frac{4\pi^2}{GM}d^3$

Waves & Sound:

Frequency / Wave Speed $f = \frac{1}{T}$ $v_{wave} = \lambda f$

Doppler Effect $f_{perceived} = f_{Source}\left(\frac{v \pm v_{obs}}{v \mp v_{source}}\right)$