The following equations and data might be useful:

Acceleration due to gravity at earth's surface:	$g = 9.80\,\mathrm{m\,s^{-2}}$
Speed of light in a vacuum	$c = 3.00 \times 10^8$ m s^{-1}
Permittivity of free space	$\epsilon_0 = 8.85 \times 10^{-12}$ F m^{-1}
Mass of one proton	$m_p = 1.673 \times 10^{-27}$ kg
Mass of one electron	$m_e = 9.11 \times 10^{-31}$ kg
Charge of an electron	$e = 1.60 \times 10^{-19}$ C
Boltzmann's constant	$k_B = 1.38 \times 10^{-23}$ J K^{-1}
Planck's constant	$h = 6.626 \times 10^{-34}$ J s
	$= 4.136 \times 10^{-15}$ eV s
	$\hbar = \dfrac{h}{2\pi} = 1.055 \times 10^{-34}$ J s
	$= 6.582 \times 10^{-16}$ eV s
The Stefan-Boltzmann constant	$\sigma = 5.67 \times 10^{-8}$ W m^{-2} K^{-4}
Rydberg	$R_\infty = 13.606$ eV
The universal gas constant	$R = 8.314$ J K^{-1} mol^{-1}
Specific heat of liquid water	$c_{\mathrm{water}} = 4184$ J kg^{-1} K^{-1}
Specific heat of ice	$c_{\mathrm{ice}} = 2050$ J kg^{-1} K^{-1}
Heat of fusion for water	$L_{\mathrm{f,water}} = 3.34 \times 10^5$ J kg^{-1}
Heat of vapourisation for water	$L_{\mathrm{v,water}} = 2.26 \times 10^6$ J kg^{-1}
Speed of sound in air	$= 343$ m s^{-2}
Density of water (20°C and 1 atm)	$= 1.00 \times 10^3$ kg m^{-3}
Conversion factors:	$1\,\mathrm{eV} = 1.60 \times 10^{-19}$ J
	$0\,°\mathrm{C} = 273.15$ K
	$1\,\mathrm{L} = 10^{-3}\,\mathrm{m}^3$
Area of a Sphere:	$A = 4\pi r^2$

Prefixes:
f $= 10^{-15}$, p $= 10^{-12}$, n $= 10^{-9}$, $\mu = 10^{-6}$, m $= 10^{-3}$, k $= 10^3$, M $= 10^6$, G $= 10^9$, T $= 10^{12}$

Heat & Thermodynamics equations

Thermal expansion:	$\Delta L = \alpha L_i \Delta T$ $\quad \Delta V = \beta\, V_i\, \Delta T$ $\quad \beta = 3\alpha$
Heating/Cooling:	$Q = mc\Delta T$ $\quad Q = mL$
Thermal motion in a gas:	$K_{\text{ave,trans}} = \frac{1}{2}mv_{\text{th}}^2 = \frac{3}{2}kT$ $\quad v_{\text{th}} = \sqrt{3kT/m}$
Heat Transfer by radiation:	$P_{\text{net}} = P_{\text{abs}} - P_{\text{em}} = e\sigma A(T_{\text{env}}^4 - T^4)$
Heat Transfer by conduction:	$H = \frac{Q}{t} = kA\frac{T_h - T_c}{L}$ $\quad H$ is heat flow in watts.
First Law and Work:	$\Delta U = Q + W$ $\quad W = -\int_{V_i}^{V_f} p\, \mathrm{d}V$
Ideal Gas Law:	$pV = nRT$ $\quad$ Where n is the number of moles of gas.
Internal energy (ideal gas):	$U = \frac{3}{2}nRT$(monatomic) $\quad \Delta U = nC_V\Delta T$
γ (ideal gas):	$\gamma = \frac{C_p}{C_V}$
	$\gamma_{\text{monatomic}} = \frac{5}{3}$
	$\gamma_{\text{diatomic}} = \frac{7}{5}$
	$\gamma_{\text{polyatomic}} = \frac{4}{3}$
Work (ideal gas):	$W_{\text{isothermal}} = -nRT\ln\left(\frac{V_f}{V_i}\right)$ $\quad W_{\text{adiabatic}} = \frac{p_f V_f - p_i V_i}{\gamma - 1}$
Specific Heat (ideal gas):	$Q = nC_V\Delta T$ $\quad Q = nC_p\Delta T$
	$C_p = C_V + R$ $\quad C_V = \frac{f}{2}R$
Adiabatic process in ideal gas:	$pV^\gamma = \text{constant}$ $\quad TV^{\gamma-1} = \text{constant}$
Entropy change:	$\Delta S = \frac{Q}{T}$ (constant T) $\quad \Delta S = \int_i^f \frac{\mathrm{d}Q}{T}$ $\quad \Delta S = mc\ln\left(\frac{T_f}{T_i}\right)$

Mechanics equations

$\mathbf{p} = m\mathbf{v}$	$\mathbf{F} = \dfrac{\mathrm{d}\mathbf{p}}{\mathrm{d}t}$	$\mathbf{L} = I\boldsymbol{\omega}$	$\boldsymbol{\tau} = \dfrac{\mathrm{d}\mathbf{L}}{\mathrm{d}t}$
$\mathbf{v} = \boldsymbol{\omega} \times \mathbf{r}$	$\boldsymbol{\tau} = \mathbf{r} \times \mathbf{F}$	$\mathbf{L} = \mathbf{r} \times \mathbf{p}$	$I_z = \sum_i m_i r_i^2$
$K_{\text{trans}} = \dfrac{1}{2}mv^2$	$K_{\text{rot}} = \dfrac{1}{2}I\omega^2$	$F_{\text{grav}} = -\dfrac{GMm}{r^2}$	$U_{\text{grav}} = -\dfrac{GMm}{r} + U_0$
$F(x) = -\dfrac{\mathrm{d}U}{\mathrm{d}x}$	$f \leq \mu_s N$	$f = \mu_k N$	$\int_{x_0}^{x} F(x)\mathrm{d}x = U(x_0) - U(x)$

Circular motion: $\mathbf{v} = \dfrac{\mathrm{d}\mathbf{r}}{\mathrm{d}t} = r\,\dot{\vartheta}\,\hat{\mathbf{e}}_\vartheta$ $\qquad \mathbf{a} = \dfrac{\mathrm{d}\mathbf{v}}{\mathrm{d}t} = -r\,\dot{\vartheta}^2\,\hat{\mathbf{e}}_r = -\omega^2\mathbf{r}$

Kinematics: $v = v_0 + at$ $\qquad x = x_0 + v_0 t + \dfrac{1}{2}at^2$ $\qquad v^2 = v_0^2 + 2a(x - x_0)$

Waves & Optics equations

Frequency:	$f = \frac{1}{T}$
Angular Frequency:	$\omega = 2\pi f$
Wave number:	$k = \frac{2\pi}{\lambda}$
Average Power of Wave on a String:	$\bar{P} = \frac{1}{2}\mu v \omega^2 A^2$
Intensity:	$I = \frac{P}{A}$
Standing Waves:	$L = \frac{n}{2}\lambda, \quad n = 1, 2, 3, ...$
	$L = \frac{m}{4}\lambda, \quad m = 1, 3, 5, ...$
Doppler Effect:	$f' = \frac{f}{1 \pm \frac{u}{v}}$
Snell's Law:	$n_1 \sin\theta_1 = n_2 \sin\theta_2$
Refractive Index:	$n = \frac{c}{v}$
Critical Angle:	$\sin\theta_c = \frac{n_2}{n_1}$
Double Slit (Bright Fringes)	$d\sin\theta = m\lambda, \quad m = 0, 1, 2, ...$
Double Slit (Dark Fringes)	$d\sin\theta = (m + \frac{1}{2})\lambda, \quad m = 0, 1, 2, ...$
N Slit (Bright Fringes)	$d\sin\theta = m\lambda, \quad m = 0, 1, 2, ...$
N Slit (Dark Fringes)	$d\sin\theta = \frac{m}{N}\lambda, \quad m = 1, 2, 3, ...\ AND\ m \neq multiple\ of\ N$
Single Narrow Slit (Destructive):	$a\sin\theta = m\lambda, \quad m = 1, 2, 3, ...$
Rayleigh Criterion (single slit):	$\theta_{min} = \frac{\lambda}{a}$
Law of Malus:	$I = I_0 \cos^2\theta$
Trigonometric Identities:	$\sin(\frac{\pi}{2} \pm x) = \cos x$
	$\sin\alpha \pm \sin\beta = 2\sin\frac{1}{2}(\alpha \pm \beta)\cos\frac{1}{2}(\alpha \mp \beta)$
	$\cos\alpha + \cos\beta = 2\cos\frac{1}{2}(\alpha + \beta)\cos\frac{1}{2}(\alpha - \beta)$
	$\cos\alpha - \cos\beta = 2\sin\frac{1}{2}(\alpha + \beta)\sin\frac{1}{2}(\beta - \alpha)$

Electricity equations

$V_{\text{sphere}} = \frac{4}{3}\pi r^3$	$A_{\text{sphere}} = 4\pi r^2$
$A_{\text{circle}} = \pi r^2$	$C_{\text{circle}} = 2\pi r$
Electric Force:	$\vec{F} = q\vec{E}$
Electrical Potential:	$V = \frac{U}{q}$
Potential difference:	$\Delta V = -\int_a^b \vec{E} \cdot \mathrm{d}\vec{l}$
Field of point charge:	$\vec{E} = \frac{1}{4\pi\epsilon_0}\frac{q}{r^2}\,\hat{r}$
Potential of point charge:	$V = \frac{1}{4\pi\epsilon_0}\frac{q}{r}$
Gauss's Law:	$\Phi_E = \oint \vec{E} \cdot \mathrm{d}\vec{A} = \frac{q_{\text{enclosed}}}{\epsilon_0}$
Electric Field from Potential:	$\vec{E} = -\vec{\nabla}V = -(\frac{\partial V}{\partial x}, \frac{\partial V}{\partial y}, \frac{\partial V}{\partial z})$
Field of Sphere:	$\vec{E} = \frac{1}{4\pi\epsilon_0}\frac{q}{r^2}\,\hat{r}$
Field near *conducting* sheet:	$E_{\text{sheet}} = \frac{\sigma}{\epsilon_0}$
Field near *non-conducting* sheet:	$E_{\text{sheet}} = \frac{\sigma}{2\epsilon_0}$
Field of linear charge distribution:	$E_{\text{line}} = \frac{\lambda}{2\pi\epsilon_0 r}$
Capacitance:	$C = \frac{Q}{V}$
Parallel plate Capacitor:	$C_{\parallel} = \frac{\epsilon_0 A}{d}$
	$\Delta V = Ed$
Capacitor Energy:	$U_C = \frac{1}{2}CV^2$

Breakdown of Classical Physics equations

$$c = f\lambda, \qquad f = \frac{E}{h}, \qquad \lambda = \frac{h}{p}$$

$$E = \sqrt{|\vec{p}|^2 c^2 + m^2 c^4},$$

$$E = |\vec{p}|c \quad \text{for photons}$$

$$K_{\text{max}} = hf - \Phi,$$

$$\Delta\lambda = \lambda' - \lambda = \frac{h}{mc}(1 - \cos\phi)$$

$$T \approx \mathrm{e}^{-2bL}, \text{ where } b = \frac{\sqrt{2m(U - E)}}{\hbar}$$

$$r_n = \frac{n^2 \epsilon_0 h^2}{Z\pi e^2 m_e}, \qquad m_e v r = n\hbar$$

$$I(T) = \sigma T^4$$

$$\lambda_{\text{max}} T = 2.898 \times 10^{-3} \text{ m K}$$

$$\sin\theta = m\frac{\lambda}{a}, \quad m = 1, 2, 3, \ldots$$

$$L = n\hbar = n\frac{h}{2\pi}, \quad n = 1, 2, 3, \ldots$$

$$\Delta p\,\Delta x \geq \frac{\hbar}{2}, \qquad \Delta E\,\Delta t \geq \frac{\hbar}{2}$$

$$E = -\frac{RZ^2}{n^2}, \text{ where } R = 13.606\,\text{eV}$$

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