

$$\begin{aligned}
G &= 6.67 \times 10^{-11} \text{ N} \cdot \text{m}^2/\text{kg}^2 \\
g &= 9.8 \text{ m/s}^2 \\
c &= 3.00 \times 10^8 \text{ m/s} \\
\rho_{\text{ice}} &= 0.92 \times 10^3 \text{ kg/m}^3 \\
\rho_{\text{water}} &= 1.00 \times 10^3 \text{ kg/m}^3 \\
\rho_{\text{blood}} &= 1.06 \times 10^3 \text{ kg/m}^3 \\
\rho_{\text{lead}} &= 11.3 \times 10^3 \text{ kg/m}^3 \\
N_A &= 6.02 \times 10^{23} \text{ mol}^{-1} \\
m_e &= 9.11 \times 10^{-31} \text{ kg} \\
m_p &= 1.67 \times 10^{-27} \text{ kg} \\
1 \text{ m} &= 3.28 \text{ ft} \\
1 \text{ lb} &= 4.45 \text{ N} \\
1 \text{ atm} &= 1.013 \times 10^5 \text{ Pa} \\
\frac{d}{dx} x &= 1 \\
\frac{d}{dx} (au) &= a \frac{du}{dx} \\
\frac{d}{dx} (u+v) &= \frac{du}{dx} + \frac{dv}{dx} \\
\frac{d}{dx} x^m &= mx^{m-1} \\
\frac{d}{dx} (uv) &= u \frac{dv}{dx} + v \frac{du}{dx} \\
\int dx &= x \\
\int au \, dx &= a \int u \, dx \\
\int (u+v) \, dx &= \int u \, dx + \int v \, dx \\
\int x^m \, dx &= \frac{x^{m+1}}{m+1} \quad (m \neq -1) \\
\Delta x &= x_2 - x_1 \\
\bar{v} &= \frac{\Delta x}{\Delta t} = \frac{x_2 - x_1}{t_2 - t_1} \\
\bar{s} &= \frac{\text{total distance}}{\Delta t} \\
v &= \frac{dx}{dt} \\
\bar{a} &= \frac{\Delta v}{\Delta t} = \frac{v_2 - v_1}{t_2 - t_1} \\
a &= \frac{dv}{dt} \\
v &= v_0 + at \\
x - x_0 &= v_0 t + \frac{1}{2} at^2 \\
v^2 &= v_0^2 + 2a(x - x_0) \\
x - x_0 &= \frac{1}{2} (v_0 + v)t \\
x - x_0 &= vt - \frac{1}{2} at^2 \\
a_x &= a \cos \theta \\
a_y &= a \sin \theta \\
a &= \sqrt{a_x^2 + a_y^2}
\end{aligned}$$

$$\begin{aligned}
\tan \theta &= \frac{a_y}{a_x} \\
\vec{a} \cdot \vec{b} &= ab \cos \phi \\
c &= ab \sin \phi \\
\vec{v} &= \frac{d\vec{r}}{dt} \\
\vec{a} &= \frac{d\vec{v}}{dt} \\
x - x_0 &= v_{0x}t \\
y - y_0 &= v_{0y}t - \frac{1}{2}gt^2 \\
y &= (\tan \theta_0)x - \frac{gx^2}{2(v_0 \cos \theta_0)^2} \\
R &= \frac{v_0^2}{g} \sin(2\theta_0) \\
a &= \frac{r}{r} \\
T &= \frac{2\pi r}{v} \\
\Sigma \vec{F} &= m\vec{a} \\
W &= mg \\
\vec{F}_{AB} &= -\vec{F}_{BA} \\
f_s &= \mu_s N \\
f_k &= \mu_k N \\
F &= \frac{mv^2}{r} \\
K &= \frac{1}{2}mv^2 \\
\Delta K &= K_f - K_i = W \\
W &= Fd \cos \phi \\
W &= \vec{F} \cdot \vec{d} \\
W_g &= mgd \cos \phi \\
\Delta K &= W_a + W_g \\
W &= \int_{x_1}^{x_2} F(x) \, dx \\
F &= -kx \\
W_s &= -\frac{1}{2}kx^2 \\
\bar{P} &= \frac{W}{t} \\
P &= \frac{\Delta E}{\Delta t} \\
P &= \vec{F} \cdot \vec{v} \\
U &= mgy \\
U(x) &= \frac{1}{2}kx^2 \\
E &= K + U \\
F(x) &= -\frac{dU(x)}{dx} \\
W_{\text{app}} &= \Delta E \\
\Delta E &= -f_k d \\
P &= \frac{dE}{dt} \\
x_{\text{com}} &= \frac{1}{M} \Sigma_{i=1}^n m_i x_i
\end{aligned}$$

$$\begin{aligned}
\vec{r}_{\text{com}} &= \frac{1}{M} \sum_{i=1}^n m_i \vec{r}_i \\
x_{\text{com}} &= \frac{1}{M} \int x \, dm \\
x_{\text{com}} &= \frac{1}{V} \int x \, dV \\
\Sigma \vec{F}_{\text{ext}} &= M \vec{a}_{\text{com}} \\
\vec{p} &= m \vec{v} \\
\Sigma \vec{F} &= \frac{d\vec{p}}{dt} \\
\vec{F} &= M \vec{a}_{\text{com}} \\
\Sigma \vec{F}_{\text{ext}} &= \frac{d\vec{P}}{dt} \\
\vec{P} &= \text{constant} \\
\vec{J} &= \int_{t_1}^{t_2} \vec{F}(t) \, dt \\
\vec{p}_f - \vec{p}_i &= \Delta \vec{p} = \vec{J} \\
v_{1f} &= \frac{m_1 - m_2}{m_1 + m_2} v_{1i} \\
v_{2f} &= \frac{2m_1}{m_1 + m_2} v_{1i} \\
v_{\text{cm}} &= \frac{P}{m_1 + m_2} \\
\theta &= \frac{s}{r} \\
\Delta \theta &= \theta_2 - \theta_1 \\
\omega &= \frac{d\theta}{dt} \\
\alpha &= \frac{d\omega}{dt} \\
\omega &= \omega_0 + \alpha t \\
\theta - \theta_0 &= \omega_0 t + \frac{1}{2} \alpha t^2 \\
\omega^2 &= \omega_0^2 + 2\alpha (\theta - \theta_0) \\
\theta - \theta_0 &= \frac{1}{2} (\omega_0 + \omega) t \\
\theta - \theta_0 &= \omega t - \frac{1}{2} \alpha t^2 \\
s &= \theta r \\
v &= \omega r \\
a_t &= \alpha r \\
a_r &= \frac{v^2}{r} = \omega^2 r \\
J &= \Sigma m_i r_i^2 \\
J &= \int r^2 \, dm \\
K &= \frac{1}{2} J \omega^2 \\
\tau &= r F \sin \phi \\
\tau &= J \alpha \\
\Sigma \tau &= J \alpha \\
v_{\text{cm}} &= \omega R \\
K &= \frac{1}{2} J_{\text{cm}} \omega^2 + \frac{1}{2} M v_{\text{cm}}^2 \\
\vec{\tau} &= \vec{r} \times \vec{F} \\
\vec{l} &= \vec{r} \times \vec{p} = m (\vec{r} \times \vec{v}) \\
\Sigma \vec{\tau} &= \frac{d\vec{l}}{dt}
\end{aligned}$$

$$\begin{aligned}
L &= I \omega_{m_1 m_2} \\
F &= G \frac{m_1 m_2}{r^2} \\
U &= -G \frac{m_1 m_2}{r} \\
v &= \sqrt{\frac{2GM}{R}} \\
T &= 1/f \\
\omega &= 2\pi f \\
\omega &= \sqrt{\frac{k}{m}} \\
x &= A \cos(\omega t + \phi) \\
\omega &= \sqrt{\frac{L}{g}} \\
1 \text{ atm} &= 1.013 \times 10^5 \text{ Pa} \\
\rho &= \frac{\Delta m}{\Delta V} \\
p &= \frac{\Delta F}{\Delta A} \\
p_2 &= p_1 + \rho g (y_1 - y_2) \\
p &= p_0 + \rho g h \\
R &= Av \\
\rho + \frac{1}{2} \rho v_1^2 + \rho g y_1 &= p_2 + \frac{1}{2} \rho v_2^2 + \rho g y_2 \\
p + \frac{1}{2} \rho v^2 + \rho g y &= \text{a constant} \\
v &= \lambda f \\
k &= 2\pi/\lambda \\
y(x, t) &= A \cos(kx - \omega t)
\end{aligned}$$