$$
\begin{aligned}
G &= 6.67 \times 10^{-11} \ N \cdot m^2/kg^2 \\
g &= 9.8 m/s^2 \\
c &= 3.00 \times 10^8 m/s \\
m_{\mathrm{e}} &= 9.11 \times 10^{-31} \ kg \\
m_{\mathrm{p}} &= 1.67 \times 10^{-27} \ kg \\
1 \text{ m} &= 3.28 \text{ ft} \\
1 \text{ lb} &= 4.45 \ N \\
\frac{d}{dx} x &= 1 \\
\frac{d}{dx} (au) &= a \frac{du}{dx} \\
\frac{d}{dx} (u+v) &= \frac{du}{dx} + \frac{dv}{dx} \\
\frac{d}{dx} x^m &= m x^{m-1} \\
\frac{d}{dx} (uv) &= u \frac{dv}{dx} + v \frac{du}{dx} \\
\int dx &= x \\
\int au \ dx &= a \int u \ dx \\
\int (u+v) \, dx &= \int u \ dx + \int v \ dx \\
\int x^m \ dx &= \frac{x^{m+1}}{m+1} \quad (m \neq -1) \\
\Delta x &= x_2 - x_1 \\
\bar{v} &= \frac{\Delta x}{\Delta t} = \frac{x_2 - x_1}{t_2 - t_1} \\
\bar{s} &= \frac{\text{total distance}}{\Delta t} \\
v &= \frac{dx}{dt} \\
\bar{a} &= \frac{\Delta v}{\Delta t} = \frac{v_2 - v_1}{t_2 - t_1} \\
a &= \frac{dv}{dt} \\
v &= v_0 + at \\
x - x_0 &= v_0 t + \frac{1}{2} a t^2 \\
v^2 &= v_0^2 + 2a(x - x_0) \\
x - x_0 &= \frac{1}{2}(v_0 + v) t \\
x - x_0 &= vt - \frac{1}{2} a t^2 \\
a_x &= a \cos \theta \\
a_y &= a \sin \theta \\
a &= \sqrt{a_x^2 + a_y^2} \\
\tan \theta &= \frac{a_y}{a_x} \\
\vec{a} \cdot \vec{b} &= ab \cos \phi \\
c &= ab \sin \phi \\
\vec{v} &= \frac{d\vec{r}}{dt} \\
\vec{a} &= \frac{d\vec{v}}{dt} \\
x - x_0 &= v_{0x} t \\
y - y_0 &= v_{0y} t - \frac{1}{2} g t^2 \\
y &= (\tan \theta_0) x - \frac{g x^2}{2 (v_0 \cos \theta_0)^2}
\end{aligned}
$$

$$
\begin{aligned}
R &= \frac{v_0^2}{g} \sin(2\theta_0) \\
a &= \frac{v^2}{r} \\
T &= \frac{2\pi r}{v} \\
\Sigma \vec{F} &= m\vec{a} \\
W &= mg \\
\vec{F}_{\mathrm{AB}} &= -\vec{F}_{\mathrm{BA}} \\
f_s &= \mu_s N \\
f_k &= \mu_k N \\
F &= \frac{m v^2}{r} \\
K &= \frac{1}{2} m v^2 \\
\Delta K &= K_f - K_i = W \\
W &= Fd \cos \phi \\
W &= \vec{F} \cdot \vec{d} \\
W_g &= mgd \cos \phi \\
\Delta K &= W_a + W_g \\
W &= \int_{x_i}^{x_f} F(x) \ dx \\
F &= -kx \\
W_s &= -\frac{1}{2} k x^2 \\
\bar{P} &= \frac{W}{\Delta t} \\
P &= \frac{dW}{dt} \\
P &= \vec{F} \cdot \vec{v} \\
U &= mgy \\
U(x) &= \frac{1}{2} k x^2 \\
E &= K + U \\
F(x) &= -\frac{dU(x)}{dx} \\
W_{\mathrm{app}} &= \Delta E \\
\Delta E &= -f_k d \\
P &= \frac{dE}{dt} \\
x_{\mathrm{com}} &= \frac{1}{M} \Sigma_{i=1}^{n} m_i x_i \\
\vec{r}_{\mathrm{com}} &= \frac{1}{M} \Sigma_{i=1}^{n} m_i \vec{r}_i \\
\Sigma \vec{F}_{\mathrm{ext}} &= M \vec{a}_{\mathrm{cm}} \\
\vec{p} &= m\vec{v} \\
\Sigma \vec{F} &= \frac{d\vec{p}}{dt} \\
\vec{P} &= M \vec{v}_{\mathrm{cm}} \\
\Sigma \vec{F}_{\mathrm{ext}} &= \frac{d\vec{P}}{dt} \\
\vec{P} &= \text{constant}
\end{aligned}
$$