Formulae/Constants:

$y = A\sin(kx - \omega t + \phi)$, for traveling wave

$f = \frac{\omega}{2\pi} = \frac{1}{T}$, $k\omega = 2\pi$, $v = f\lambda = \frac{\omega}{k}$

$y = (2A\sin kx)\cos\omega t$, for standing wave

$f_m = \frac{m}{2L}\sqrt{\frac{T}{\mu}}$, $m = 1, 2, 3, \ldots$ for wave in cord

$f_m = m\frac{\lambda}{2}$, $m = 1, 2, 3, \ldots$ for standing wave with matched B.C.s

$f_{2m-1} = (2m-1)\frac{\lambda}{4}$, $m = 1, 2, 3, \ldots$ standing wave, mis-matched B.C.s

$\beta = 10\log\left(\frac{I}{I_0}\right)$, where $I_0 = 10^{-12}\ \mathrm{W/m^2}$

$I = \frac{1}{2}\rho v(\omega s_{\max})^2 = \frac{\Delta P_{\max}^2}{2\rho v} = \frac{\boldsymbol{P}_{av}}{4\pi r^2}$, $\frac{I_1}{I_2} = \frac{r_2^2}{r_1^2}$

$P_1 + \frac{1}{2}\rho v_1^2 + \rho g y_1 = P_2 + \frac{1}{2}\rho v_2^2 + \rho g y_2 = \text{constant}$, (Bernoulli's law)

$\frac{T_1^2}{T_2^2} = \frac{r_1^3}{r_2^3}$, (Kepler's 3rd law)

$T = 2\pi\sqrt{\frac{L}{g}}$, for pendulum

$F_{\mathrm{g}} = mg$ $\quad$ $\mathrm{PE} = mgy$ $\quad$ $\mathrm{KE} = \frac{1}{2}mv^2$

$W = Fd\cos\theta$ $\quad$ $a_{\mathrm{c}} = \frac{v^2}{r}$ $\quad$ $P = Fv\cos\theta$

For spring: $F = -kx$ $\quad$ $\mathrm{KE} = \frac{1}{2}kx^2$

$F_{\mathrm{g}} = G\frac{m_1 m_2}{r^2}$, where $G = 6.67\times10^{-11}\, N\cdot\frac{m^2}{kg^2}$

$W_{\mathrm{net}} = \Delta\mathrm{KE}$, for conservative system and outside force

$\Delta\mathrm{PE} + \Delta\mathrm{KE} = 0$, for a conservative system

$$\tau = rF_{\perp} = rF\sin\theta$$

$$\tau = I\alpha, \text{ where } I = \frac{1}{2}mr^2$$

for a solid cylinder.

$$v = v_0 + at \qquad \omega = \omega_0 + \alpha t$$

$$x = x_0 + v_0 t + \frac{1}{2}at^2 \qquad \theta = \theta_0 + \omega_0 t + \frac{1}{2}\alpha t^2$$

$$v^2 = v_0^2 + 2a\left(x - x_0\right) \qquad \omega^2 = \omega_0^2 + 2\alpha\left(\theta - \theta_0\right)$$

$$\bar{v} = \frac{v + v_0}{2} \qquad \bar{\omega} = \frac{\omega + \omega_0}{2}$$

$$\theta = \frac{l}{r} \qquad \omega = \frac{v_{\tan}}{r} \qquad \alpha = \frac{a_{\tan}}{r}$$

$$a_{centripetal} = \frac{v_{\tan}^2}{r} = r\omega^2$$

$$\mathrm{KE}_{\mathrm{rot}} = \frac{1}{2}I\omega^2$$

$L = I\omega = rp\sin\theta$, angular momentum

$$\bar{\tau}_{\mathrm{net}} = \frac{\Delta L}{\Delta t}$$

$\Delta L = 0$, for system with no outside torques