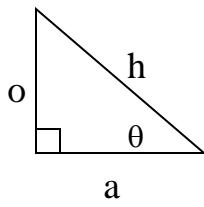


# Physics 121 Formulas

$$\begin{aligned}\sin \theta &= o/h \\ \cos \theta &= a/h \\ \tan \theta &= o/a\end{aligned}$$



$$o^2 + a^2 = h^2$$

## Kinematics

$$\begin{aligned}v &= \Delta x / \Delta t \quad (\text{constant velocity}) \\ a &= \Delta v / \Delta t \quad (\text{constant acceleration}) \\ \Delta x &= v_o t + \frac{1}{2} a t^2 \\ v_f^2 &= v_o^2 + 2 a \Delta x\end{aligned}$$

## Dynamics

$$\begin{aligned}F_{\text{net}} &= ma \\ F_g &= Gm_1 m_2 / r^2 \\ F_g &= mg \quad (\text{near surface of earth}) \\ F_{\mu s} &\leq \mu_s F_N \\ F_{\mu k} &= \mu_k F_N \\ F_{\text{spring}} &= -k \Delta x\end{aligned}$$

## Constants

$$\begin{aligned}G &= 6.67 \times 10^{-11} \text{ N} \cdot \text{m}^2 / \text{kg}^2 \\ M_E &= 5.98 \times 10^{24} \text{ kg} \\ R_E &= 6.38 \times 10^6 \text{ m}\end{aligned}$$