Equation Sheet

Linear Motion

$\bar{v} = \frac{\Delta s}{\Delta t}$ (average velocity)

$\bar{v} = \frac{v_1 + v_0}{2}$ (average velocity)

$a = \frac{\Delta v}{\Delta t}$ (acceleration)

$v_1^2 = v_0^2 + 2a\Delta x$ (sans time)

$d = v_0 t + \frac{1}{2} a\Delta t^2$ (displacement)

$v_1 = v_0 + a\Delta t$ (motion)

$x_1 = x_0 + v_0\Delta t + \frac{1}{2} a\Delta t^2$ (horizontal position)

$y = mx + b$ (y-intercept)

$y_1 = y_0 + v_0\Delta t + \frac{1}{2} a\Delta t^2$ (vertical position)

$m = \frac{y_2 - y_1}{x_2 - x_1}$ (slope)

Forces

$\Sigma F = ma$

$w = mg$ (weight)

$F_N = mg$ (normal force)

$F_N = mg\cos\theta$ (inclined plane)

$F_s = \mu_s F_N$ (static friction)

$F_k = \mu_k F_N$ (kinetic friction)

$\rho = mv$ (momentum)

$Ft = \Delta\rho$ (impulse)

$\sum p_0 = \sum p_1$ (conservation of momentum)

$m_0 v_0 = m_1 v_1$ (conservation of momentum)

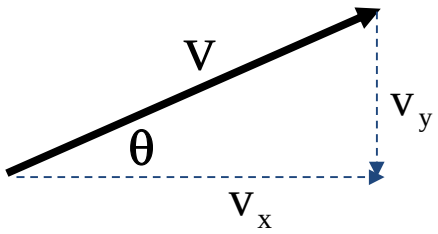
$m_1 v_1 + m_2 v_2 = m_1 v_1 + m_4 v_4$ (collision equation)

$m_1 v_1 + m_2 v_2 = (m_1 + m_2) v_3$

Vector Components

$v_x = v\cos\theta$

$v_y = v\sin\theta$



Work and Power

$W = Fd$ (work)

$P = \frac{W}{t}$ (power)

$PE = mgh$ (potential energy)

$KE = \frac{1}{2}mv^2$ (kinetic energy)

Torque

$\tau = F\ell$ (torque)

$\sum \tau_0 = \sum \tau_1$

$\tau_1 + \tau_2 + \ldots = \tau_3 + \tau_4 + \ldots$

Circular Motion

$\Delta\theta = \frac{s}{r}$

$\omega = \frac{v}{r}$

$\omega = \frac{\Delta\theta}{\Delta t}$

$\alpha = \frac{\Delta\omega}{\Delta t}$

$\alpha = \frac{a}{r}$

$\omega_1 = \omega_0 + \alpha\Delta t$

$\theta_1 = \theta_0 + \omega_0\Delta t + \frac{1}{2}\alpha\Delta t^2$

$a_c = \frac{v^2}{r}$

$a_c = r\omega^2$

$F_c = \frac{mv^2}{r}$

$F_c = mr\omega^2$

Notes

"I have learned that people will forget what you said, people will forget what you did, but they will never forget how YOU made them Feel"

-- Maya Angelou