General Physics 1 (PHY 2048) Formula Sheet

Kinematics

- Displacement: $\vec{s} = \vec{r_f} - \vec{r_i}$
- Velocity: $\vec{v} = \frac{d\vec{r}}{dt}$
- Acceleration: $\vec{a} = \frac{d\vec{v}}{dt}$
- Kinematic equations:

$$v = v_0 + at$$
$$x = x_0 + v_0 t + \frac{1}{2}at^2$$
$$v^2 = v_0^2 + 2a(x - x_0)$$

Dynamics

- Newton's Second Law: $\vec{F} = m\vec{a}$
- Weight: $W = mg$
- Friction: $f = \mu N$
- Gravitational Force: $F_g = G\frac{m_1 m_2}{r^2}$

Energy

- Kinetic Energy: $KE = \frac{1}{2}mv^2$
- Potential Energy (gravitational): $PE = mgh$
- Work: $W = \vec{F} \cdot \vec{d}$
- Work-Energy Theorem: $W_{net} = \Delta KE$

Momentum

- Momentum: $\vec{p} = m\vec{v}$
- Impulse: $\vec{J} = \Delta\vec{p}$
- Conservation of Momentum: $\vec{p}_{initial} = \vec{p}_{final}$