Physics 11 and 12 Equations and Formulae

Kinematics (1D and 2D)

- Vector and Scalar quantities
- Uniform motion
- Accelerated motion
- Projectile motion
- Relationships between variables

$$d = v_i \cdot t + \tfrac{1}{2} a \cdot t^2$$

$$v_f = v_i + a \cdot t$$

$$V_f^2 = V_i^2 + 2 \cdot a \cdot d$$

$$d = \frac{v_i + v_f}{2} \cdot t$$

Dynamics (1D and 2D)

- Forces
  - Gravitational
  - Spring (Hooke's Law)
  - Normal
  - Tension
  - Friction
- Newton's Laws of Motion

$$F = \frac{G \cdot m_1 \cdot m_2}{r^2}$$

$$F = k \cdot x$$

$$F_N = m \cdot g$$

$$F = m \cdot a$$

$$F = \mu \cdot F_N$$

Momentum (1D)

- Momentum
- Law of conservation of momentum
- Impulse

$$P = m \cdot v$$

$$F \cdot t = m \cdot \Delta v$$

Energy, Work, and Power

- Potential and kinetic energy
- Thermal energy
- Law of conservation of energy
- Work, power, and efficiency

$$PE_{grav} = m \cdot g \cdot h$$

$$PE_{spring} = 0.5 \cdot k \cdot x^2$$

$$W = F \cdot d$$

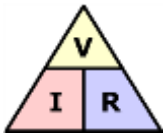
$$P = \frac{W}{T}$$

Electric Circuits

Ohm's Law

Kirkoff's Laws

Power and Efficiency



$P = \Delta v \cdot I$

$P = I^2 \cdot R$

$P = \frac{\Delta v^2}{R}$

Electrostatics

Electric charge

Electric force

Electric field

Electric potential energy

Applications of electrostatics

$F = K_E \cdot \frac{q_1 \cdot q_2}{r^2}$

$E = \frac{F}{q}$

$E = \frac{K \cdot q}{d^2}$

Electromagnetic Forces and Induction

Faraday's Law

Lenz's Law

Circular Motion and Gravitation

Uniform Circular Motion

Kinematics

Dynamics

Universal Gravitation Law

Gravitational field strength

$v = \frac{2 \cdot \pi \cdot r}{t}$

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

$F_{net} = m \cdot \frac{v^2}{r}$

$F = \frac{G \cdot m_1 \cdot m_2}{r^2}$

$G = \frac{F}{m}$