

# Physics 11

## Kinematics (1D)

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

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

## Dynamics (1D)

Forces  
    Gravitational  
    Spring  
    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

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

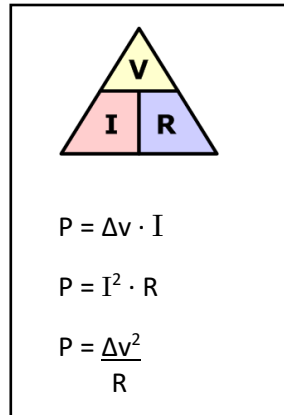
$$PE_{\text{grav}} = m \cdot g \cdot h$$
$$PE_{\text{spring}} = 0.5 \cdot k \cdot x^2$$
$$W = F \cdot d$$
$$P = \frac{W}{T}$$

## Electric Circuits

Ohm's Law

Kirchoff's Laws

Power and Efficiency



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*Choose any TWO of the following:*

## Quantum Physics

Heisenberg's uncertainty principle

Wave-particle duality

Photoelectric effect

Applications of quantum theory

## Waves and Optics

Types of waves

Properties of waves and wave behaviours

Light behaviours

Law of reflection

Refraction

Lenses

Ray diagrams

Applications of geometric optics

## **Special Relativity**

Michelson-Morley experiment

Postulates of special relativity

Relative motion and effects

time dilation

length contraction

mass increase

equivalence of energy and mass

## **Nuclear Physics**

Radioisotopes

Decay

Fission

Fusion