

## Mechanics

### Momentary Speed

$$v = \frac{dx}{dt}$$

### Momentary Acceleration

$$a = \frac{dv}{dt} = \frac{d^2x}{dt^2}$$

### Momentum

$$\mathbf{p} = \mathbf{m} \cdot \mathbf{v}$$

### Force

$$\mathbf{F} = \frac{d\mathbf{p}}{dt} = m \cdot \mathbf{a}$$

### Gravitation

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

### Centripetal Acceleration

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

### Work

$$W = \int_{x_1}^{x_2} F(x) dx$$

### Kinetic Energy

$$K = \frac{m \cdot v^2}{2}$$

### Potential Energy

$$W = -\Delta U, F = -\frac{dU}{dx}$$

### Reduced Mass

$$\frac{1}{\mu} = \frac{1}{m} + \frac{1}{M}$$

## Angular Frequency

$$\omega = 2\pi f = \frac{2\pi}{T}$$