# Constants

## Conversions

## Basic Formulas

# Kinematics

## Circular Motion

# Force and Energy

|  |  |  |
| --- | --- | --- |
|  | Force | Energy |
| Gravity (on earth) |  |  |
| Gravity (in space) |  |  |
| Spring |  |  |
| External Force |  |  |
| Kinetic Friction |  |  |
| Drag |  |  |
| Buoyancy |  |  |
| Electric |  |  |
| Magnetic |  |  |
| Magnetic |  |  |
| Normal Force |  | (for ground) |
| Tension |  |  |
| Static Friction |  | (for ground) |
| Kinetic Energy |  |  |
| Rotational Kinetic |  |  |
| Chemical Energy |  |  |
| Thermal Energy |  |  |

## Newton’s Law

|  |  |
| --- | --- |
|  |  |

# Rotational Motion

## Moments of Inertia

## Rolling

# Momentum and Energy

## Conservation Laws

# Fluids

(fluid not moving)

# Oscillations and Waves

## General Oscillations

## General Waves

## Specific Examples

# Thermodynamics

## Laws

## Heat

# Wave Optics

## Light Waves

## Quantum

## Interference

## Diffraction

# Geometric Optics

|  |  |  |
| --- | --- | --- |
| Quantity | Positive when | Negative when |
|  | Object in front | Object behind |
|  | Image where light is (real) | Image not where light is (virtual) |
|  | Converging lens, concave mirror | Diverging lens, convex mirror |
|  | Upright | Inverted |

## Optical Instruments

# Fields

Field through a distance

Force through a distance

## Sources

## Induction

# Circuits

## Kirchhoff’s Laws

|  |  |  |  |
| --- | --- | --- | --- |
| Component |  | Sign | Energy |
| Battery |  | Icon  Description automatically generated |  |
| Capacitor |  | Diagram  Description automatically generated |  |
| Resistor |  | drops going with |  |

## Components

|  |  |  |
| --- | --- | --- |
| Capacitors | Add | Const |
| Series |  |  |
| Parallel |  |  |
| **Resistors** | **Add** | **Const** |
| Series |  |  |
| Parallel |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| RC Circuits |  | |  |
| Charging |  |  | |
| Discharging |  |