Physics Reference Sheet

Useful Equations

$$v_{av} = \frac{d}{t}$$

v_{av} = average velocity
d = displacement
t = time

$$a_{av} = \frac{v_f - v_i}{t}$$

a_{av} = average acceleration
v_f = final velocity
v_i = initial velocity
t = time

$$F = ma$$

F = net force
m = mass
a = acceleration

$$W = mg$$

W = weight
m = mass
g = acceleration due to gravity

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

F = force
G = gravitational constant
m_1 = mass of first object
m_2 = mass of second object
d = distance between the objects

$$F = k\frac{q_1 q_2}{d^2}$$

F = force
k = Coulomb's constant
q_1 = charge on first object
q_2 = charge on second object
d = distance between the objects

$$KE = \tfrac{1}{2}mv^2$$

KE = kinetic energy
m = mass
v = speed

$$PE = mgh$$

PE = potential energy
m = mass
g = acceleration due to gravity
h = height

$$T = \frac{1}{f}$$

T = period
f = frequency

Useful Equations (continued)

$$v = \lambda f$$

v = speed
λ = wavelength
f = frequency

$$E = hf = h\left(\frac{c}{\lambda}\right)$$

E = energy
h = Planck's constant
f = frequency
c = speed of light
λ = wavelength

$$a^2 + b^2 = c^2$$

Values of Physical Constants

g = 9.8 m/s^2
G = 6.67×10^{-11} Nm^2/kg^2
k = 9.0×10^9 Nm^2/C^2
h = 6.63×10^{-34} Js
c = 3.00×10^8 m/s

Physical Quantities and Units

Quantity	Unit (abbreviation)
electric charge	coulomb (C)
energy	joule (J)
force	newton (N)
frequency	hertz (Hz)
length	meter (m)
mass	kilogram (kg)
temperature	degrees Celsius (°C)
time	second (s)