

CONSTANT ACCELERATION FORMULAE



$$v = u + at$$

$$s = ut + 0.5at^2$$

$$s = vt - 0.5at^2$$

$$s = \frac{(u + v) \times t}{2}$$

$$v^2 = u^2 + 2as$$

v = final velocity (m/s)
 u = initial velocity (m/s)
 a = acceleration (m/s²)
 s = displacement (m)
 t = time (s)

TORQUE

$$T = F \times d \times \sin(\theta)$$



T = Torque (Nm)
 F = Force applied on lever (N)
 d = Distance that the force is applied from the axis of rotation (m)
 θ = Angle between force vector and distance vector, sin(θ) is equal to 1 if perpendicular

NEWTON'S 2ND LAW OF MOTION



$$\Sigma F = m \times a$$

ΣF = net force acting on an object (N)
 m = mass of object (kg)
 a = acceleration of object (m/s²)

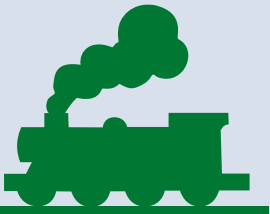
MECHANICAL ENERGY

$$ME = U_s + U_g + KE$$



ME = mechanical energy (J)
 U_s = spring potential energy, a.k.a elastic potential energy (J)
 U_g = gravitational potential energy (J)
 KE = kinetic energy (J)

MOMENTUM



$$p = mv$$

p = Momentum (kg x m/s)
 m = Mass (kg)
 v = Velocity (m/s)

GRAVITATIONAL POTENTIAL ENERGY

$$U_g = mgh$$



U_g = gravitational potential energy (J)
 m = Mass of object (kg)
 g = Acceleration due to gravity = 9.8 m/s² = gravitational field strength = 9.8 N/kg
 h = Vertical height above a reference level (m)

TEMPERATURE CHANGE



$$Q = m \times C \times (T_{\text{final}} - T_{\text{initial}})$$

Q = heat energy applied (J)
m = mass of object (kg)
c = specific heat capacity of object (J/kg/K)
T = initial and final temperatures of object (K)

FORCE ON A MOVING CHARGE



$$F = qvb$$

F = Magnetic Force
q = Charge of the particle
v = Velocity of the charged particle
b = Magnetic Field Strength

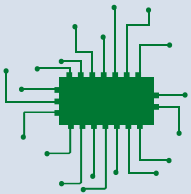
OHM'S LAW



$$V = IR$$

V = Voltage (volts)
I = Current (amps)
R = Resistance (ohms)

ELECTRICAL POWER



$$P = IV = I^2R = \frac{V^2}{R}$$

P = Power
V = Voltage (volts)
I = Current (amps)
R = Resistance (ohms)

KINETIC ENERGY



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

KE = Kinetic energy of object (J)
m = Mass of object (kg)
v = Velocity of object (m/s)

GRAVITATIONAL FORCE



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

F = gravitational force of attraction from the center of mass of the two objects (N)
G = gravitational constant 6.674×10^{-11} Nm kg
m1 = mass of one of the objects (kg)
m2 = mass of the other object (kg)
r = distance between the center of the mass of the two objects (m)

PRESSURE



$$P = \frac{F}{A}$$

P = Pressure (N/m or Pascals)
F = Force applied on a surface (N)
A = Area of surface (m²)

ARCHIMEDES PRINCIPLE



$$F_b = F_{g \text{ of object}} = F_{g \text{ of fluid displaced}} = \rho_{\text{fluid}} \times V_{g \text{ of fluid displaced}} \times g$$

F_b = Force of buoyancy (N)
F_{g of object} = Weight of object (N)
F_{g of fluid displaced} = Weight of fluid displaced (N)
ρ_{fluid} = Density of fluid (kg/m³)
V_{fluid displaced} = Volume of fluid displaced by the object in the fluid (m³)
g = gravitational field strength, a.k.a acceleration due to gravity = 9.8 N/kg = 9.8 m/s²

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Signups Close Tuesday 18th of February



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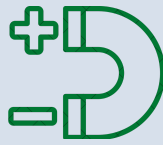
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ELECTROSTATIC FORCE



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

F = electrostatic force acting between two charged objects (N)

k = Coulomb's constant = $9.0 \times 10 \text{ NmC}$

q1 = magnitude of one of the charged object (C)

q2 = magnitude of the other charged object (C)

r = distance between the center of the two charges (m)

WORK



$$W = F \times d \times \cos(\theta)$$

W = Work done (J)

F = Force applied on object (N)

d = Distance object moves due to the application of the force (m)

θ = Angle between force vector and displacement vector, $\cos(\theta)$ is equal to 1 when the force vector is in the same direction as the movement of the object

or

$$W = F \times d$$

W = Work done (J)

F = Component of the force that acts parallel to the distance only (N)

d = Distance object moves due to the application of the force (m)



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