Science

Physics Equations

Paper 1

Equation	Symbols	Units
kinetic energy = 0.5 × mass × speed^2 $E_k = \frac{1}{2} m v^2$	E_k = kinetic energy	J
	m = mass	kg
	v = speed	m/s
gravitational potential energy = mass × gravitational field strength × height $E_p = m g h$	E_p = gravitational potential energy	J
	m = mass	kg
	g = gravitational field strength	N/kg
	h = height	m
power = $\frac{\text{energy transferred}}{\text{time}}$ $P = \frac{E}{T}$	P = power	W
	E = energy transferred	J
	t= time	s
power = $\frac{\text{work done}}{\text{time}}$ $P = \frac{W}{T}$	P = power	W
	W = work done	J
	t = time	s
efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	Efficiency	(% if x100)
efficiency = $\frac{\text{useful power output}}{\text{total power input}}$	Efficiency	(% if x100)
charge flow = current × time $Q = I t$	Q = charge flow	C
	I = current	A
	t = time	s
potential difference = current × resistance $V = I R$	V = potential difference	V
	I = current	A
	R = resistance	Ω
power = potential difference × current $P = V I$	P = power	W
	V = potential difference	V
	I = current	A
power = current^2 × resistance $P = I^2 R$	P = power	W
	I = current	A
	R = resistance	Ω
energy transferred = power × time $E = P t$	E = energy transferred	J
	P = power	W
	t = time	s
energy transferred = charge flow × potential difference $E = Q V$	E = energy transferred	J
	Q = charge flow	C
	V = potential difference	V
density = $\frac{\text{mass}}{\text{volume}}$ $\rho = \frac{m}{V}$	ρ = density	kg/m^3
	m = mass	kg
	v = volume	m^3