CIE 2023-24/5

IGCSE Equations

Co-ordinated / Physics

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Equations in bold are for Extended only (not Core)

Equations highlighted in blue are for Physics only (not Co-ordinated)

average speed = total distance / total time

acceleration = change in velocity / time

weight = mass x gravitational field strength

density = mass / volume

force = spring constant x extension

force = mass x acceleration

moment = force x perpendicular distance from the pivot

momentum = mass x velocity

impulse = force x time for which it acts = change in momentum

resultant force = change in momentum / time

kinetic energy = ½ x mass x speed^2

change in gravitational potential energy = mass x gravitational field strength x change in height

work done = force x distance moved = energy transferred

$$\textbf{efficiency} = \frac{\textbf{useful energy output}}{\textbf{total energy input}} \times 100\%$$

$$\textbf{efficiency} = \frac{\textbf{useful power output}}{\textbf{total power input}} \times 100\%$$

power = work done / time

power = energy transferred / time

pressure = force / area

change in pressure = density of liquid x gravitational field strength x change in depth

temperature in kelvin = temperature in degrees Celsius + 273

pressure x volume = constant (for a gas)

change in thermal energy = mass x specific heat capacity x change in temperature

wave speed = frequency x wavelength

n = sin i / sin r **n = 1 / sin c**

current = charge / time

voltage = work done / charge

resistance = voltage / current

power = current x voltage

energy transferred = current x voltage x time

$$\frac{\textbf{resistance}_1}{\textbf{resistance}_2} = \frac{\textbf{voltage}_1}{\textbf{voltage}_2}$$

$$\frac{\text{primary voltage}}{\text{secondary voltage}} = \frac{\text{turns on the primary coil}}{\text{turns on the secondary coil}}$$

current in primary coil x voltage across the primary coil = current in secondary coil x voltage across the secondary coil

power = current^2 x resistance

$$\textbf{orbital speed} = \frac{\textbf{2 x π x orbital radius}}{\textbf{time period}}$$

Hubble constant = speed of galaxy / distance from Earth

1 / Hubble constant = approximate age of the Universe