WJEC England Physics A Level

Section 1.1 - Basic Physics

Flashcards

What are SI units?

What are SI units?

Fundamental (base) units of physical quantities.

What is the SI unit of mass?

What is the SI unit of mass?

Kg (kilogram)

What physical quantity is measured in mol?

What physical quantity is measured in mol?

Amount of a substance.

What is the SI unit of current?

What is the SI unit of current?

Amperes (A)

Is the SI unit for temperature ℃ or K ?

Is the SI unit for temperature ºC or K ?

K (kelvin) as this is the absolute scale.

What is the SI unit of length?

What is the SI unit of length?

Metres (m)

What quantity is measured in seconds?

What quantity is measured in seconds?

Time.

Are Newtons (N) an SI unit?

Are Newtons (N) an SI unit?

No, Newtons are not fundamental. The SI units for force are kg m s^{-2} (Since force = mass x acceleration).

Derive the SI units of energy.

Derive the SI units of energy.

Kinetic energy = ½ x mass x velocity^2

Units = kg x (m/s) x (m/s)

$= kg\ m^2\ s^{-2}$

Derive the SI units of force.

Derive the SI units of force.

Force = mass x acceleration

Units = kg x m s^{-2}

= $kg\ m\ s^{-2}$

Express 60TΩ in standard form.

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$$6 \times 10^{13}$$

(T is tera and the multiplier is 10^{12})

Write 0.000003m with a suitable prefix.

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3μm

What is the actual value of 8MΩ?

What is the actual value of 8MΩ?

$$8,000,000\Omega \quad \text{or} \quad 8\times10^{6}\Omega$$

What is 6000pF in nF?

What is 6000pF in nF?

6nF, as 1 nano unit is 1000 pico units.

What multiplier is associated with the prefix kilo (k)?

What multiplier is associated with the prefix kilo(k)?

x 1000 (10^3)

What multiplier is associated with the prefix femto (f)?

What multiplier is associated with the prefix femto (f)?

10^{-15}

Express 7GΩ in standard form.

Express 7GΩ in standard form.

$$7 \times 10^9 \; \Omega$$

What is 1 eV in J?

What is 1eV in J?

$$1eV = 1.6 \times 10^{-19} \text{ J}$$

Express 6 kWh in joules.

Express 6 kWh in joules.

6 kW = 6000 J/s   1 hour = 3600s

6kWh = 6000 x 3600

= 21.6 x 10^6 J

= 21.6 MJ

Convert 6.6 pJ to eV.

Convert 6.6 pJ to eV.

$$6.6 \text{ pJ} = 6.6 \times 10^{-12} \text{ J}$$

$$\text{Divide by } 1.6 \times 10^{-19}$$

$$6.6 \text{ pJ} = 4.1 \times 10^{7} \text{ eV (2s.f.)}$$

$$= 41 \text{ MeV}$$

What is meant by a scalar quantity?

What is meant by a scalar quantity?

A quantity that only has a magnitude.

What is a vector quantity?

What is a vector quantity?

A quantity that has magnitude as well as direction.

Is acceleration a vector or scalar quantity?

Is acceleration a vector or scalar quantity?

Vector.

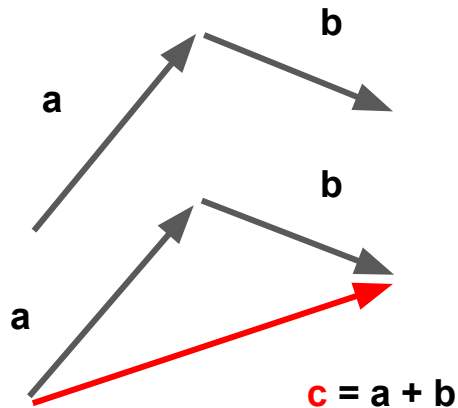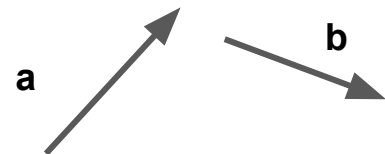# Is mass a scalar or vector quantity?
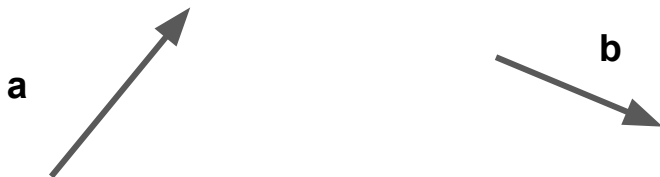
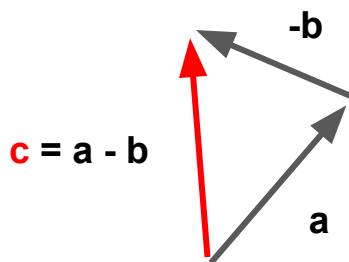# Is mass a scalar or vector quantity?
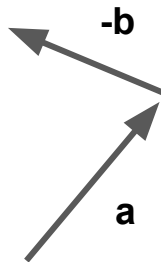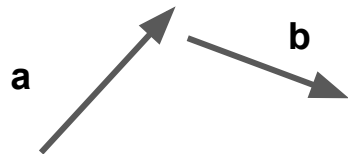
Scalar.

Draw the vector addition of the following:

a

b

Draw the vector addition of the following:

a

b

b

a

b

a

c = a + b

Draw the vector subtraction of the following:

a

b

Draw the vector subtraction of the following: **a**   **b**

-b

a

-b

c = a - b

a

Draw how you would resolve this vector into horizontal and vertical components:

a
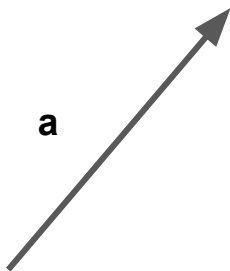
Draw how you would resolve the vector into horizontal and vertical components
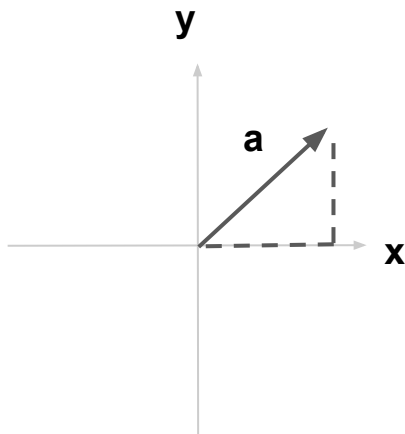
What equation is used to calculate density?

What equation is used to calculate density?

$$\rho = m / V$$

Density = Mass / Volume

Density units: kg m^{-3}

Mass units: kg

Volume units: m^3

What is a moment?

What is a moment?

A turning force.

Force × perpendicular distance from the point to the line of action of the force

If an object is in equilibrium, the sum of the anticlockwise moments would be…

If an object is in equilibrium, the sum of the anticlockwise moments would be...

Equal to the sum of the clockwise moments (principle of moments).

If an object is in equilibrium it means the object is …

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Not accelerating. It is either:

- Stationary.
- Moving at a constant velocity.

How can the forces acting on a object be shown to be in equilibrium?

How can the forces acting on a object be shown to be in equilibrium?

- Adding the horizontal and vertical components of the forces acting on it and showing they equal zero.
- Or if there are 3 forces acting on the object you can draw a scale diagram - if the scale diagram forms a closed triangle, then the object is in equilibrium.

What is meant by a couple?

What is meant by a couple?

A pair of equal and opposite coplanar forces that have equal magnitude and opposite direction, applied to a body parallel to each other but not along the same line. For example:

What is meant by the centre of gravity?

What is meant by the centre of gravity?

The point through which all the weight of an object acts. For a uniform object, the centre of gravity is the geometric centre of the object.