CIE Physics A Level

1 - Physical Quantities and Units

Flashcards

What are SI units?

What are SI units?

The fundamental (base) units of physical quantities.

What is the SI unit of mass?

What is the SI unit of mass?

Kilogram, kg

What physical quantity is measured in mol?

What physical quantity is measured in mol?

Amount of substance.

What is the SI unit of current?

What is the SI unit of current?

Amperes, A

Is the SI unit for temperature ºC or K?

Is the SI unit for temperature °C or K ?

K (kelvin) as this is the absolute scale.

What is the SI unit of length?

What is the SI unit of length?

Metre, 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 F = ma).

Derive the SI units of energy.

Derive the SI units of energy.

$$\textit{Kinetic energy} = \tfrac{1}{2} \times \textit{mass} \times \textit{velocity}^2$$

$$\text{Units} = \text{kg} \times (\text{m/s})^2 = \text{kg m}^2\,\text{s}^{-2}$$

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.

Express 60TΩ in standard form.

6×10^{13}

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

Write 0.000003m with a suitable prefix.

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$3\mu m$ ($3 \times 10^{-6} m$)

What is the actual value of 8MΩ?

What is the actual value of 8MΩ?

$8{,}000{,}000\Omega$ or $8 \times 10^{6}\Omega$

What is 6000pF in nF?

What is 6000pF in nF?

6nF (since 1 nF = 1000 pF)

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

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

x1000 (10^3)

Express 7GΩ in standard form.

Express 7GΩ in standard form.

$7 \times 10^9\ \Omega$

What is Avogadro's constant a measure of?

What is Avogadro's constant a measure of?

The number of atoms in 0.012kg of carbon-12.

What is a mole a measure of?

What is a mole a measure of?

One mole of a given substance is defined as the amount with a number of particles equal to the Avogadro Constant N_A.

What is meant by a scalar quantity?

What is meant by a scalar quantity?

A quantity that has only magnitude.

What is a vector quantity?

What is a vector quantity?

A quantity that has a magnitude as well as a 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.

Calculate the magnitude of a force F that is 30º to the horizontal and has a horizontal component of 7.0N.

Calculate the magnitude of a force F that is 30º to the horizontal and has a horizontal component of 7.0N.

$$F_{horizontal} = F\cos\theta$$

$$7.0 = F\cos 30º$$

$$F = 7.0 / \cos 30º = 8.1N$$

Draw the vector addition of the following:

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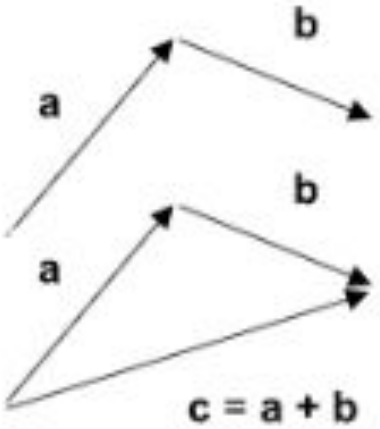
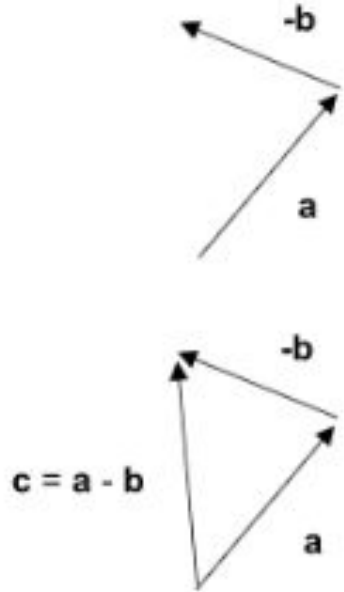
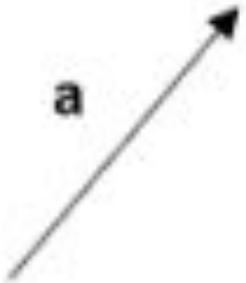


Draw the vector subtraction of the following:

Draw the vector subtraction of the following



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



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