OCR B Physics A Level

2 - Fundamental Data Analysis

Flashcards

What is an uncertainty?

What is an uncertainty?

An uncertainty in a measurement is anything that may cause the value to differ from the true value.

What is the resolution of a measuring instrument?

What is the resolution of a measuring instrument?

The resolution of an instrument is the smallest increment that produces a noticeable change in the value.

How do you combine uncertainties when adding values?

How do you combine uncertainties when adding values?

Add the absolute uncertainties.

How do you combine uncertainties when subtracting values?

How do you combine uncertainties when subtracting values?

Add the absolute uncertainties.

How do you combine uncertainties when multiplying values?

How do you combine uncertainties when multiplying values?

Add the percentage uncertainties.

How do you combine uncertainties when dividing values?

How do you combine uncertainties when dividing values?

Add the percentage uncertainties.

How do you combine uncertainties when raising values to powers?

How do you combine uncertainties when raising values to powers?

Multiply the percentage uncertainty by the power.

How do you calculate percentage uncertainty?

How do you calculate percentage uncertainty?

Percentage Uncertainty = (Uncertainty/Measurement) x 100

How do you calculate the uncertainty of repeat readings?

How do you calculate the uncertainty of repeat readings?

The uncertainty is equal to half the range of the measured values.

How do you calculate the uncertainty of a gradient?

How do you calculate the uncertainty of a gradient?

Draw the steepest and shallowest line of worst fit (which passes through all error bars). Calculate the gradient of the line of best and worst fit. The uncertainty is the difference between these gradients.

What is the S.I base unit for distance?

What is the S.I base unit for distance?

Metre, M

What is the S.I base unit for mass?

What is the S.I base unit for mass?

Kilogram, kg

What is the S.I base unit for time?

What is the S.I base unit for time?

Second, s

What is the S.I base unit for temperature?

What is the S.I base unit for temperature?

Kelvin, K

What is the derived S.I unit for force?

What is the derived S.I unit for force?

$kgms^{-2}$

Express 0.006 in standard form.

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$$0.006 = 6 \times 10^{-3}$$

What prefix is used for $x10^6$?

What prefix is used for $x10^6$?

Mega, M

What prefix is used for $x10^{-9}$?

What prefix is used for $x10^{-9}$?

Nano, n

What is the standard form version of the prefix ‘pico’?

What is the standard form version of the prefix ‘pico’?

$x\ 10^{-12}$

What is the standard form version of the prefix ‘giga’?

What is the standard form version of the prefix ‘giga’?

$x\ 10^{9}$

What prefix is used for $x10^{-15}$?

What prefix is used for $x10^{-15}$?

Femto, f

What prefix is used for $x10^{-6}$?

What prefix is used for $x10^{-6}$?

Micro, μ

What is a systematic error?

What is a systematic error?

A systematic error will cause all results to be too high or too low by the same amount each time.

What is a zero error?

What is a zero error?

A zero error is when a zero input doesn't produce a zero output on a measuring instrument.

What is noise?

What is noise?

Noise is where random variations are superimposed onto a signal output.

What is response time?

What is response time?

An instrument's response time is the time it takes for an instrument to generate an output from an input.

What does it mean if an experiment is repeatable?

What does it mean if an experiment is repeatable?

A repeatable experiment is one that can be repeated by the same person using the same method, and similar results are obtained.

What does it mean if an experiment is reproducible?

What does it mean if an experiment is reproducible?

A reproducible experiment is one that can be repeated by a different person using a different method, and similar results are obtained.

What is the purpose of calibrating a measuring input?

What is the purpose of calibrating a measuring input?

Calibrating involves ensuring the output value matches the true input value so that the measurement the instrument gives is correct. This will reduce the effect of systematic errors.

What is accuracy?

What is accuracy?

Accuracy is a measure of how close a measurement is to the true value.

What is precision?

What is precision?

Precision is a measure of how close a measurement is to the mean value.