Measurement error

Learn and practise | Free preview

A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Distinguish absolute, relative and percentage error.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

Absolute error is the magnitude of measured minus reference value, in the original units. Relative error divides that by the reference magnitude; percentage error multiplies by 100%.

Rounding to a measurement increment gives an interval of possible true values. For rounding to the nearest unit, error is at most half a unit, subject to the chosen boundary convention.

Worked example

A reading is 24.6 cm against reference 25 cm. Find all three errors.

Absolute error=0.4 cm.

Relative error=0.4/25=0.016; percentage=1.6%.

Answer: 0.4 cm; 0.016; 1.6%

Try it yourself

Name: _____ Date: _____

1. Measured 51 g, reference 50 g: find absolute error.

2. Measured 198 m, reference 200 m: find percentage error.

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. 1 g

|51-50|.

2. 1%

2/200×100.

Curriculum reference: VC2M9M04

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