Logarithmic measurement scales

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

• Interpret logarithmic scales as multiplicative comparisons.

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

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

On a base 10 logarithmic scale, an increase of 1 represents multiplying the underlying quantity by 10. Equal scale gaps represent equal ratios rather than equal differences.

Use the exact stated scale formula. Some real scales include additional multipliers, so do not assume every named logarithmic scale has identical numerical interpretation.

Worked example

A scale is L=log10(Q), Q>0. Compare Q for L=3 and L=5.

Q values are 10^{3} and 10^{5}.

Ratio=$10^{(5-3)}$.

Answer: The second quantity is 100 times the first.

Try it yourself

Name: _____ Date: _____

1. On L=log10(Q), find L when Q=10 000.

2. Find Q when L=-2.

Answers and explanations

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

1. 4

$10^4 = 10\,000$.

2. 0.01

$10^{-2} = 1/100$.

Curriculum reference: VC2M10M02

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