Year 10A extension | Number

Logarithms and inverse exponentials

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

- Use logarithm laws and the inverse relationship with exponentials.
- Explain a method and check the reasonableness of a result.

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

$\log_b(a)=c$ means $b^c=a$, with $b>0$, $b\neq1$ and $a>0$. Logarithms turn products into sums, quotients into differences and powers into multipliers.

Exponential and logarithmic functions with the same base are inverses. Their graphs reflect across $y=x$; domain restrictions must be checked when solving logarithmic equations.

Worked example

Solve $\log_2(x-1)=3$.

Convert to $x-1=2^3=8$.

$x=9$ satisfies $x>1$.

Answer: $x=9$

Try it yourself

Name: _____ Date: _____

1. Evaluate $\log_3(81)$.

2. Evaluate $\log_{10}(0.001)$.

Answers and explanations

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

1. 4

$3^4=81$.

2. -3

$10^{-3}=0.001$.

Curriculum reference: VC2M10AN03; VC2M10AA04

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