

Exercise walk-through

Logarithmic Expressions ■ 2.9

eXercise

You must be able to

- convert between **logarithmic** 对数 and exponential form
- evaluate simple logarithms

Method — Logarithms

$\log_b(y) = x$ means exactly $b^x = y$. A logarithm answers the question “**what exponent?**”.

- $\log_{10}$ is the **common log**;
- $\ln$ is the **natural log** (base e).

Method — Example

$\log_2(8) = 3$ because $2^3 = 8$.

Practice 2.1 ■ 1 mark

Rewrite $\log_b(y) = x$ in exponential form.

Solution 2.1

Worked steps

$$b^x = y \quad \text{B1}.$$

Practice 2.2 ■ 1 mark

Evaluate $\log_2(8)$.

Solution 2.2

Worked steps

3 **B1**.

Practice 2.3 ■ 2 marks

Evaluate $\log_{10}(1000)$.

Solution 2.3

Worked steps

$\log_{10}(1000) = 3$ since $10^3 = 1000$ **M1** **A1**.

Exam-style 3.1 ■ 1 mark

$\log_b(y) = x$ is equivalent to

A $b^y = x$

B $b^x = y$

C $x^b = y$

D $y^x = b$

Solution 3.1

A $b^y = x$

B $b^x = y$ 

C $x^b = y$

D $y^x = b$

Worked steps

B.

Exam-style 3.2 ■ 1 mark

$\log_3(9)$ equals

A 2

B 3

C 9

D 27

Solution 3.2

A 2



B 3

C 9

D 27

Worked steps

A.

Exam-style 3.3 ■ 1 mark

Evaluate each.

(a) $\log_5(25)$.

(b) $\log_{10}(100)$.

(c) $\log_2(1)$.

Solution 3.3

Worked steps

(a) 2 **B1**. (b) 2 **B1**. (c) 0 **B1**.