Meaning of a logarithm

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. Evaluate $\log_2 32$. [2 marks]

$2^5 = 32$.

Answer: 5

2. Evaluate $\log 0.001$. [2 marks]

$10^{-3} = 0.001$.

Answer: -3

3. Write $7^2 = 49$ as a logarithmic statement. [2 marks]

The exponent 2 becomes the value of the logarithm.

Answer: $\log_7 49 = 2$

4. Evaluate $10^{\log 7}$. [2 marks]

The exponential and its base-ten logarithm are inverse operations for positive inputs.

Answer: 7

5. Explain why $\log 0$ is not a real number. [3 marks]

$10^x > 0$ for every real x; it approaches zero without reaching it.

Answer: No real exponent on 10 gives zero.

6. If $\log N = 4.2$, between which consecutive powers of ten does N lie? [3 marks]

$4 < 4.2 < 5$ and the function 10^x increases.

Answer: $10^4 < N < 10^5$