ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 2

Unit 2: Logarithms — Beginner Practice

15 multiple-choice questions Suggested time: **15 minutes** 1 mark each

Name: _____ Date: _____ Score: / 15

Circle one answer for each question. The answer key with explanations is on the last pages, so try every question before you check. These are practice questions, not official FBISE papers.

1. If $\log_b x = y$, which statement must be true?

(A) $b = x^y$
(B) $x = y^b$
(C) $y = b^x$
(D) $x = b^y$

2. Why is $\log_5(-1)$ undefined?

(A) Because −1 is an integer
(B) Because no power of 5 gives a negative number
(C) Because the base must be negative
(D) Because 5 is a prime number

3. A number is in scientific notation when it is written as $d \times 10^n$, where:

(A) $d > 10$ and n is a natural number
(B) $1 \le d < 10$ and n is an integer
(C) $1 < d \le 10$ and n is a fraction
(D) $0 \le d < 10$ and n is any real number

4. If $b^y = x$, then y is called the:

(A) logarithm of x to the base b
(B) characteristic of x
(C) antilog of x
(D) mantissa of x

5. In $0.00045 = 4.5 \times 10^{-4}$, why is the exponent negative?

(A) Because the number is greater than 10
(B) Because 4.5 is positive
(C) Because the number is smaller than 1
(D) Because the number has two digits

6. Which number is correctly written in scientific notation?

(A) 625×10^0
(B) 62.5×10^1
(C) 0.625×10^2
(D) 6.25×10^1

7. Which logarithm is defined?

(A) $\log_3 0$
(B) $\log_3 9$
(C) $\log_1 7$
(D) $\log_3(-9)$

8. What is the value of $\log_b 1$, for any valid base b?

(A) 1
(B) b
(C) undefined
(D) 0

9. The fractional part of a logarithm is called the:

(A) base
(B) characteristic
(C) mantissa
(D) antilog

10. Write 4500 in scientific notation.

(A) 4.5×10^3
(B) 0.45×10^4
(C) 45×10^2
(D) 4.5×10^4

11. Which statement about the mantissa is correct?

(A) It can be negative
(B) It is always greater than 1
(C) It is 0 or positive, and less than 1
(D) It is the integral part of the logarithm

12. Find x if $\log_3 x = 2$.

(A) 9
(B) 8
(C) 5
(D) 6

13. What does $\log_{10} 1000 = 3$ tell us?

(A) 3 raised to the power 10 gives 1000
(B) 10 raised to the power 3 gives 1000
(C) $10 \times 3 = 1000$
(D) 1000 raised to the power 3 gives 10

14. Evaluate $\log_2 8$.

(A) 8
(B) 2
(C) 3
(D) 4

15. The exponential form of $\log_2 128 = 7$ is:

(A) $2^7 = 128$
(B) $7^2 = 128$
(C) $128^7 = 2$
(D) $2^{128} = 7$

Answer key

Unit 2 · Beginner Practice

1 D	**2** B	**3** B	**4** A	**5** C
6 D	**7** B	**8** D	**9** C	**10** A
11 C	**12** A	**13** B	**14** C	**15** A

Explanations

1. D. $x = b^y$
Changing $\log_b x = y$ to exponential form gives $b^y = x$.

2. B. Because no power of 5 gives a negative number
5^y is positive for every real y, so it can never equal −1.

3. B. $1 \le d < 10$ and n is an integer
The coefficient d must satisfy $1 \le d < 10$, and the power n must be an integer. For example, 5.3×10^7.

4. A. logarithm of x to the base b
$b^y = x$ and $y = \log_b x$ are the same statement. So y is the logarithm of x with base b.

5. C. Because the number is smaller than 1
A number smaller than 1 needs a negative exponent. The decimal point moves four places to the right.

6. D. 6.25×10^1
Only 6.25 lies between 1 and 10. The other coefficients are too large or too small, even though each number has the same value.

7. B. $\log_3 9$
$\log_3 9 = 2$. The base 1, the number 0 and a negative number all make the logarithm undefined.

8. D. 0
$b^0 = 1$, so the logarithm of 1 is 0 for every valid base.

9. C. mantissa
The integral part is the characteristic. The fractional part is the mantissa, which is never negative.

10. A. 4.5×10^3
Put the decimal point after the first digit: 4.5. The point moved three places to the left, so n = 3.

11. C. It is 0 or positive, and less than 1
The mantissa is the fractional part. It is never negative and is always less than 1.

12. A. 9
Exponential form: $3^2 = x$, so x = 9.

13. B. 10 raised to the power 3 gives 1000
A logarithm is an exponent. The base 10 must be raised to the power 3 to get 1000.

14. C. 3
$2^3 = 8$, so $\log_2 8 = 3$.

15. A. $2^7 = 128$
The base 2 is raised to the logarithm 7 to give 128.

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