ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 1

Unit 1: Real Numbers — Exam Ready

25 multiple-choice questions Suggested time: **25 minutes** 1 mark each

Name: Date: Score: / 25

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. How is x ≤ 2 shown on a number line?

(A) Hollow circle at 2, arrow to the right
(B) Filled circle at 2, arrow to the left
(C) Hollow circle at 2, arrow to the left
(D) Filled circle at 2, arrow to the right

2. Which statement about integers and whole numbers is correct?

(A) Every integer is a whole number
(B) −3 is a whole number
(C) 0 is not an integer
(D) Every whole number is an integer

3. Which statement is true?

(A) √a is always rational
(B) √a is always irrational for a > 0
(C) √a is always an integer
(D) √a is a real number for a > 0

4. Which letter denotes the set of whole numbers?

(A) N
(B) W
(C) Z
(D) Q

5. Which fraction has a terminating decimal expansion?

(A) 1/3
(B) 2/7
(C) 3/8
(D) 5/6

6. Evaluate (1/4)^(−1/2).

(A) 1/2
(B) −2
(C) 4
(D) 2

7. Evaluate 4^(3/2).

(A) 6
(B) 12
(C) 8
(D) 16

8. Which of these numbers is both rational and an integer?

(A) −7
(B) √7
(C) 7/3
(D) 0.5

9. In a(b + c) = ab + ac, which operation is distributed over addition?

(A) Division
(B) Subtraction
(C) Multiplication
(D) Exponentiation

10. The set of real numbers R is the union of which two sets?

(A) $Q \cap Q'$
(B) $Q \cup Q'$
(C) $Q - Q'$
(D) $N \cup W$

11. Simplify $(x^2)^3 \cdot x^{-4}$ for $x \neq 0$.

(A) x^{-2}
(B) x^2
(C) x^{10}
(D) x^9

12. Multiplying both sides of $-2 < 5$ by -3 gives:

(A) $6 < -15$
(B) $-6 > 15$
(C) $6 > -15$
(D) $-6 < 15$

13. For $b > 0$, which expression equals $(\sqrt{b})^3$?

(A) b^(2/3)
(B) b^(1/3)
(C) b^5
(D) b^(3/2)

14. Which number lies between 1 and 2 on the number line?

(A) $\sqrt{5}$
(B) $\sqrt{9}$
(C) $-\sqrt{2}$
(D) $\sqrt{2}$

15. The additive inverse of a is:

(A) 1/a
(B) −a
(C) a
(D) 0

16. From 3x = 3y a student concludes x = y. Which property allows this, and what is the condition?

(A) Cancellation under multiplication; the multiplier must be non-zero
(B) Additive property; no condition
(C) Symmetric property; no condition
(D) Transitive property; the multiplier must be positive

17. What is $\sqrt{(-16)}$ in the real number system?

(A) 4
(B) −4
(C) 16
(D) not a real number

18. The cost of 20 articles equals the selling price of 16 articles. What is the profit percentage?

(A) 16%
(B) 20%
(C) 25%
(D) 80%

19. Which is the exponent form of $\sqrt[3]{x}$?

(A) x^3
(B) x^{-3}
(C) x^(1/3)
(D) 3x

20. A store buys an item at PKR 30 and sells it at PKR 50. What is its gross profit on 60 units sold?

(A) PKR 1,800
(B) PKR 3,000
(C) PKR 1,200
(D) PKR 2,000

21. Which of these is NOT a real number?

(A) √49
(B) $\sqrt[3]{(-8)}$
(C) √(−49)
(D) 49^(1/2)

22. Which pair has a sum of 0 and a non-zero product?

(A) 3 and 3
(B) 3 and −3
(C) 0 and 0
(D) 3 and 1/3

23. Which property states: if a = b, then b = a?

(A) Reflexive
(B) Symmetric
(C) Transitive
(D) Additive

24. If the product of two numbers is 1, the numbers are:

(A) additive inverses of each other
(B) multiplicative inverses of each other
(C) additive identities
(D) always equal

25. By the trichotomy property, for any two real numbers a and b, how many of a < b, a = b and a > b are true?

(A) Exactly one
(B) Exactly two
(C) All three
(D) None

Answer key

Unit 1 · Exam Ready

1 B	**2** D	**3** D	**4** B	**5** C
6 D	**7** C	**8** A	**9** C	**10** B
11 B	**12** C	**13** D	**14** D	**15** B
16 A	**17** D	**18** C	**19** C	**20** C
21 C	**22** B	**23** B	**24** B	**25** A

Explanations

1. B. Filled circle at 2, arrow to the left
≤ includes 2, so the circle is filled. Values below 2 lie to the left, so the arrow points left.

2. D. Every whole number is an integer
Whole numbers 0, 1, 2, … are all integers. Negative integers such as −3 are not whole numbers.

3. D. √a is a real number for a > 0
For a > 0, √a is a real number. It is rational for some a, such as 4, and irrational for others, such as 2.

4. B. W
N is natural, W is whole, Z is integers and Q is rational numbers.

5. C. 3/8
3/8 = 0.375 ends. 1/3, 2/7 and 5/6 give repeating decimals.

6. D. 2
A negative exponent flips the fraction: 4^(1/2) = 2.

7. C. 8
$4^{(3/2)} = (\sqrt{4})^3 = 2^3 = 8$.

8. A. −7
−7 is an integer and equals −7/1. √7 is irrational, and 7/3 and 0.5 are not integers.

9. C. Multiplication
The multiplier a multiplies each term inside the bracket. This is the distributive property of multiplication over addition.

10. B. Q ∪ Q′
Real numbers are all rational numbers together with all irrational numbers: R = Q ∪ Q′.

11. B. x^2
$(x^2)^3 = x^6$. Then $x^6 \cdot x^{-4} = x^{6-4} = x^2$.

12. C. 6 > −15
(−2)(−3) = 6 and 5(−3) = −15. The sign reverses because the multiplier is negative, so 6 > −15.

13. D. b^(3/2)
√b = b^(1/2), so $(b^{(1/2)})^3 = b^{(3/2)}$.

14. D. √2
√2 ≈ 1.414. √5 ≈ 2.236, √9 = 3 and −√2 is negative.

15. B. −a

a + (−a) = 0, so −a is the additive inverse.

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16. A. Cancellation under multiplication; the multiplier must be non-zero

Dividing both sides by 3 is cancellation under multiplication. It works because 3 ≠ 0.

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17. D. not a real number

No real number squared gives a negative result, so the square root of a negative number is not real.

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18. C. 25%

Let each article cost 1. Then 16 articles sell for 20, so each sells for 1.25. The profit is 0.25 on 1, which is 25%.

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19. C. x^(1/3)

The nth root of x is x^(1/n), so $\sqrt[3]{x}$ = x^(1/3).

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20. C. PKR 1,200

Profit per unit is 50 − 30 = 20. For 60 units: 60 × 20 = PKR 1,200.

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21. C. √(−49)

The square root of a negative number is not real. $\sqrt[3]{(-8)}$ = −2 is real because an odd root of a negative number exists.

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22. B. 3 and −3

3 + (−3) = 0 and 3 × (−3) = −9. The pair 0 and 0 has product 0.

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23. B. Symmetric

Reversing both sides of a true equality keeps it true. This is the symmetric property.

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24. B. multiplicative inverses of each other

Multiplicative inverses multiply to give 1, for example 4 and 1/4. They are not always equal.

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25. A. Exactly one

Exactly one of the three relations holds for any pair of real numbers.

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