ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 1

Unit 1: Real Numbers — Advanced Practice

20 multiple-choice questions Suggested time: **20 minutes** 1 mark each

Name: Date: Score: / 20

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. Which is the definition of a negative exponent ($a \neq 0$)?

(A) $a^{-n} = 1/a^n$
(B) $a^{-n} = -a^n$
(C) $a^{-n} = n/a$
(D) $a^{-n} = a^n$

2. Why does 0 have no multiplicative inverse?

(A) Because 0 is negative
(B) Because 0 is irrational
(C) Because $0 \times 1 = 1$
(D) Because no number multiplied by 0 gives 1

3. The decimal 0.1010010001… (one more zero each time, never repeating) is:

(A) rational, because it shows a pattern
(B) rational, because it lies between 0 and 1
(C) irrational, because it has many digits
(D) irrational, because it neither terminates nor repeats

4. If $a^n = b$, where n is a positive integer greater than 1, then a is written as:

(A) $n \cdot b$
(B) b^(1/n)
(C) b^n
(D) b/n

5. Evaluate (8/27)^(−2/3).

(A) 4/9
(B) 9/4
(C) −4/9
(D) 3/2

6. The sum of two irrational numbers is:

(A) always irrational
(B) always rational
(C) sometimes rational and sometimes irrational
(D) never a real number

7. If $2 < 5$, which statement is true?

(A) $1/2 < 1/5$
(B) $1/2 = 1/5$
(C) $1/2 > 1/5$
(D) $1/2 + 1/5 = 0$

8. For $x > 0$, reduce the index of $\sqrt[8]{(x^4)}$.

(A) x^2
(B) x^4
(C) $\sqrt{x}$
(D) x^(1/8)

9. Which example shows that subtraction is not commutative?

(A) $5 - 3 = 2$ but $3 - 5 = -2$
(B) $5 + 3 = 3 + 5$
(C) $5 \times 3 = 3 \times 5$
(D) $5 - 0 = 5$

10. The product rule $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{(ab)}$ can be used only when:

(A) a and b are equal
(B) the index is 2
(C) a and b are integers
(D) the indices are the same

11. Which law of exponents states $(a^m)^n = a^{mn}$?

(A) Product rule
(B) Quotient rule
(C) Power of a power rule
(D) Power of a quotient rule

12. Why can the product rule for radicals not be applied to $\sqrt[3]{3} \cdot \sqrt{2}$?

(A) Because 3 and 2 are prime
(B) Because 3 is greater than 2
(C) Because the indices 3 and 2 are different
(D) Because radicals cannot be multiplied

13. For real numbers a, b and c with $c < 0$, which statement about inequalities is correct?

(A) If $a > b$ then $ac > bc$
(B) If $a > b$ then $ac < bc$
(C) If $a > b$ then $ac = bc$
(D) The sign never changes

14. A student says: "Since $2 < 3$, multiplying both sides by -1 gives $-2 < -3$." What is wrong?

(A) Nothing, it is correct
(B) The sign should reverse: $-2 > -3$
(C) The numbers should be added, not multiplied
(D) Negative numbers cannot be compared

15. Which statement about 0 is correct?

(A) 0 is its own additive inverse
(B) 0 has a multiplicative inverse, which is 0
(C) 0 is a natural number
(D) 0 is an irrational number

16. Simplify $\sqrt{3} \times \sqrt{12}$.

(A) $\sqrt{15}$
(B) 15
(C) 36
(D) 6

17. From ac = bc, when can we conclude that a = b?

(A) Only when c > 0
(B) Always
(C) Only when a and b are positive
(D) Only when c ≠ 0

18. What is Q ∩ Q′, the overlap of rational and irrational numbers?

(A) The empty set
(B) Q
(C) Q′
(D) R

19. If $2^x = 1/32$, what is x?

(A) 5
(B) −5
(C) 1/5
(D) −1/5

20. On a number line, x > −4 is drawn with a hollow circle at −4 because:

(A) −4 is the largest value in the set
(B) −4 is a negative number
(C) the arrow points to the left
(D) −4 is not included in the set

Answer key

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

Explanations

1. A. $a^{-n} = 1/a^n$
A negative exponent gives the reciprocal of the positive power.

2. D. Because no number multiplied by 0 gives 1
A multiplicative inverse must give a product of 1. Any number times 0 is 0, never 1.

3. D. irrational, because it neither terminates nor repeats
A rational decimal terminates or repeats in a fixed block. This one does neither, so it is irrational.

4. B. b^(1/n)
a is the nth root of b, so a = b^(1/n).

5. B. 9/4
Flip the fraction to remove the negative sign: (27/8)^(2/3). The cube root is 3/2, and squaring gives 9/4.

6. C. sometimes rational and sometimes irrational
√2 + (−√2) = 0 is rational, but √2 + √2 = 2√2 is irrational. Both outcomes are possible.

7. C. 1/2 > 1/5
For positive numbers, taking reciprocals reverses the inequality. 1/2 = 0.5 and 1/5 = 0.2, so 1/2 > 1/5.

8. C. √x
$\sqrt[8]{(x^4)} = x^{(4/8)} = x^{(1/2)} = \sqrt{x}$. The numbers 4 and 8 share the factor 4.

9. A. 5 − 3 = 2 but 3 − 5 = −2
The two orders give different answers, 2 and −2, so order matters for subtraction.

10. D. the indices are the same
The rule needs radicals of the same index. √2 and $\sqrt[3]{3}$ cannot be combined this way.

11. C. Power of a power rule
Raising a power to another power multiplies the exponents.

12. C. Because the indices 3 and 2 are different
The product rule needs the same index. A cube root and a square root cannot be merged into one radical directly.

13. B. If a > b then ac < bc
Multiplying both sides by a negative number reverses the inequality sign.

14. B. The sign should reverse: −2 > −3
Multiplying by a negative number reverses the sign. −2 is to the right of −3, so −2 > −3.

15. A. 0 is its own additive inverse
0 + 0 = 0, so 0 is its own additive inverse. No number times 0 gives 1, so 0 has no multiplicative inverse.

16. **D. 6**
By the product rule, $\sqrt{3} \times \sqrt{12} = \sqrt{36} = 6$.

17. **D. Only when $c \neq 0$**
We divide both sides by c, which is allowed only when $c \neq 0$. For example $3 \times 0 = 5 \times 0$, but $3 \neq 5$.

18. **A. The empty set**
No number is both rational and irrational, so the sets are disjoint and the intersection is empty.

19. **B. −5**
$1/32 = 1/2^5 = 2^{-5}$, so x = −5.

20. **D. −4 is not included in the set**
A hollow circle shows the end value is excluded. A filled circle would mean it is included.

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