ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 4

Unit 4: Factorization and Algebraic Manipulation — 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. What is the factored form of $a^2 - b^2$?

(A) $(a - b)(a^2 + ab + b^2)$
(B) $(a + b)(a - b)$
(C) $(a + b)^2$
(D) $(a - b)^2$

2. What does it mean that 5x and 3xy are factors of $15x^2y$?

(A) Their sum is $15x^2y$
(B) They are equal to each other
(C) Their product is $15x^2y$
(D) One of them divides the other

3. The square root of an algebraic expression P is another expression Q such that:

(A) $Q + Q = P$
(B) $Q^2 = P$
(C) $Q = P^2$
(D) $Q = 2P$

4. Factorization is the process of expressing an algebraic expression as:

(A) a quotient of two terms
(B) a difference of squares
(C) a sum of its terms
(D) a product of its factors

5. Which statement about the HCF and LCM of polynomials is correct?

(A) The LCM uses the lowest powers of the common factors
(B) The LCM contains only the common factors
(C) The HCF uses the lowest powers of the common factors
(D) The HCF uses the highest powers of all factors

6. Find the HCF of $12x^2y$ and $18xy^2$.

(A) $6xy$
(B) $6x^2y^2$
(C) $12xy$
(D) $36x^2y^2$

7. Factorize $x^2 + 5x + 6$.

(A) $(x + 5)(x + 1)$
(B) $(x + 1)(x + 6)$
(C) $(x + 2)(x + 3)$
(D) $(x - 2)(x - 3)$

8. Which of these is NOT a factor of $x^2 - 4$?

(A) $x - 4$
(B) $x + 2$
(C) $x - 2$
(D) $x^2 - 4$

9. Why can $(x + 3)(x - 3)$ be written as $x^2 - 9$?

(A) Because of the formula $(a + b)(a - b) = a^2 - b^2$
(B) Because both factors are equal
(C) Because the middle term doubles
(D) Because 9 is a prime number

10. What must we do first when simplifying $(x^2 - 1)/(x + 1)$?

(A) Factorize the numerator
(B) Cancel x^2 with x
(C) Add 1 to both parts
(D) Square both parts

11. Simplify $(x^2 - 9)/(x - 3)$, for $x \neq 3$.

(A) $x - 3$
(B) $x + 3$
(C) 3
(D) $x^2 + 3$

12. The sum of two cubes $a^3 + b^3$ factorizes as:

(A) $(a - b)(a^2 + ab + b^2)$
(B) $(a + b)^3$
(C) $(a + b)(a^2 + ab + b^2)$
(D) $(a + b)(a^2 - ab + b^2)$

13. To divide one algebraic fraction by another, we:

(A) subtract the divisor
(B) multiply by the reciprocal of the divisor
(C) add the reciprocal of the divisor
(D) square the divisor

14. Which expression is a perfect square trinomial?

(A) $x^2 + 9$
(B) $x^2 + 6x + 8$
(C) $x^2 + 6x + 9$
(D) $x^2 - 9$

15. $x^2 - 5x + 6 = (x - 2)(x - 3)$. Which pair of numbers was used to split the middle term?

(A) 2 and 3, because their sum is −5
(B) −1 and −6, because their product is 6
(C) −2 and 3, because their product is −6
(D) −2 and −3, because their product is 6 and their sum is −5

Answer key

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

Explanations

1. B. (a + b)(a – b)
The difference of two squares factorizes as $a^2 - b^2 = (a + b)(a - b)$.

2. C. Their product is $15x^2y$
$5x \times 3xy = 15x^2y$, so they are factors of it.

3. B. $Q^2 = P$
Q is a square root of P when Q squared gives P.

4. D. a product of its factors
Factorization writes an expression as a product of factors. It is the opposite of multiplication.

5. C. The HCF uses the lowest powers of the common factors
HCF: lowest power and common factors. LCM: highest power and every factor.

6. A. 6xy
The HCF of 12 and 18 is 6. The lowest powers are x and y. So the HCF is 6xy.

7. C. (x + 2)(x + 3)
We need two numbers with product 6 and sum 5. These are 2 and 3, so the factors are (x + 2)(x + 3).

8. A. x – 4
$x^2 - 4 = (x + 2)(x - 2)$, so x – 4 is not a factor.

9. A. Because of the formula $(a + b)(a - b) = a^2 - b^2$
The product of a sum and a difference of the same two terms gives a difference of squares.

10. A. Factorize the numerator
$x^2 - 1 = (x + 1)(x - 1)$, so the common factor x + 1 can then be cancelled.

11. B. x + 3
$x^2 - 9 = (x + 3)(x - 3)$. Cancelling x – 3 leaves x + 3.

12. D. $(a + b)(a^2 - ab + b^2)$
$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$. The sign in the bracket is opposite to the sign in the first factor.

13. B. multiply by the reciprocal of the divisor
Dividing by a fraction means multiplying by its reciprocal: (S/U) ÷ (T/Q) = (S/U) × (Q/T).

14. C. $x^2 + 6x + 9$
$x^2 + 6x + 9 = (x + 3)^2$, because the middle term 6x is twice the product of x and 3.

15. D. –2 and –3, because their product is 6 and their sum is –5
We need two numbers with product +6 and sum –5. These are –2 and –3.

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