ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 5

Unit 5: Linear Equations and Inequalities — 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. What does it mean if the solution set of an equation is φ?

(A) The equation is linear
(B) The solution is zero
(C) The equation has two solutions
(D) No value of the variable satisfies the equation

2. Two times a number x plus 3 is between 5 and 17. Between what numbers does x lie?

(A) $8 < x < 20$
(B) $1 < x < 7$
(C) $2 < x < 14$
(D) $5 < x < 17$

3. Which is a solution of $3x - 2 < 7$?

(A) $x = 3$
(B) $x = 5$
(C) $x = 4$
(D) $x = 2$

4. Solve $4 + 2\sqrt{(3y + 1)} = 3$.

(A) $y = 3$
(B) φ (no solution)
(C) $y = -1/4$
(D) $y = 1/4$

5. Why can the equation $|x| = -6$ not be solved?

(A) x must equal 6
(B) 6 is not an integer
(C) An absolute value is never negative
(D) It has infinitely many solutions

6. Which equation is a radical equation?

(A) $(x + 1)/7 = 1$
(B) $\sqrt{(x + 1)} = 7$
(C) $|x + 1| = 7$
(D) $x + 1 = 7$

7. An equation in which the variable appears under a radical sign is called:

(A) a radical equation
(B) a linear inequality
(C) an absolute value equation
(D) an equivalent equation

8. Which number is a solution of $|x - 3| = 4$?

(A) 4
(B) 7
(C) 3
(D) 12

9. Solve $0.7(x - 1) - 0.5x = 1.1$.

(A) 1.8
(B) 0.9
(C) 9
(D) −9

10. Which pair of inequalities is written as $-6 < 5x + 3 < 5$?

(A) $5x + 3 < -6$ and $5x + 3 > 5$
(B) $-6 < 5x + 3$ and $5x + 3 < 5$
(C) $-6 < 5x + 3$ or $5x + 3 < 5$
(D) $-6 > 5x + 3$ and $5x + 3 > 5$

11. Solve $\sqrt{(2x + 1)} = 9$.

(A) 80
(B) 41
(C) 40
(D) 4

12. The symbol ≤ is read as:

(A) is greater than or equal to
(B) is not equal to
(C) is less than or equal to
(D) is less than

13. Which inequality is equivalent to $x + 5 < 8$?

(A) $x < 3$
(B) $x < 13$
(C) $x > 13$
(D) $x > 3$

14. Solve $|3x + 2| = 7$.

(A) $\{-5/3, 3\}$
(B) $\{5/3\}$
(C) $\{5/3, -3\}$
(D) $\{3, -3\}$

15. Which inequality has the solution set $\{x \mid x \in R \text{ and } x \geq 4\}$?

(A) $x - 5 \geq 1$
(B) $x - 5 \leq -1$
(C) $x + 3 \geq 10$
(D) $x - 5 \geq -1$

16. Two equations with the same solutions are called:

(A) equivalent equations
(B) radical equations
(C) compound equations
(D) extraneous equations

17. Which equation is NOT a linear equation in one variable?

(A) $xy = 14$
(B) $5x + 3 = 5$
(C) $3x = 12$
(D) $2x + 3 = 0$

18. Which statement about $\sqrt{(x - 3)} = 2$ is correct?

(A) It has no solution
(B) $x = -7$ satisfies it
(C) $x = 1$ satisfies it
(D) $x = 7$ satisfies it

19. $|ab|$ is equal to:

(A) $a + b$
(B) $|a| + |b|$
(C) $|a||b|$
(D) $|a| - |b|$

20. What is the result of solving $-3x \geq 12$?

(A) $x \leq -4$
(B) $x \geq -4$
(C) $x \geq 4$
(D) $x \leq 4$

21. The equation $|x| = 0$ has:

(A) no solution
(B) two solutions
(C) infinitely many solutions
(D) exactly one solution, $x = 0$

22. A linear inequality in one variable can be written in the form:

(A) $ax + b < 0$, where $a \neq 0$
(B) $ax + by < 0$
(C) $ax + b = 0$
(D) $ax^2 + b < 0$

23. The absolute value $|x|$ equals $-x$ when:

(A) $x < 0$
(B) $x \geq 0$
(C) $x = 0$ only
(D) $x > 0$

24. If $-4 < -2$, which statement is true after multiplying both sides by -1?

(A) $4 < 2$
(B) $4 > 2$
(C) $4 = 2$
(D) $-4 > -2$

25. A compound inequality joined with 'or' is true if:

(A) neither inequality is true
(B) only the first inequality is true
(C) both of its inequalities are true
(D) at least one of its inequalities is true

Answer key

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

Explanations

1. D. No value of the variable satisfies the equation
φ is the empty set, which means there is no solution.

2. B. $1 < x < 7$
$5 < 2x + 3 < 17$ gives $2 < 2x < 14$, so $1 < x < 7$.

3. D. $x = 2$
$3x < 9$ gives $x < 3$, so only 2 works. At $x = 3$, $3x - 2 = 7$, which is not less than 7.

4. B. φ (no solution)
$2\sqrt{(3y + 1)} = -1$, and a square root cannot be negative. The root $y = -1/4$ found by squaring is extraneous.

5. C. An absolute value is never negative
No real number has a negative distance from 0.

6. B. $\sqrt{(x + 1)} = 7$
The variable x appears under the radical sign in $\sqrt{(x + 1)} = 7$.

7. A. a radical equation
For example, $\sqrt{(x + 1)} = 7$ is a radical equation.

8. B. 7
$|7 - 3| = 4$. The other solution is $x = -1$.

9. C. 9
$0.7x - 0.7 - 0.5x = 1.1$, so $0.2x = 1.8$ and $x = 9$.

10. B. $-6 < 5x + 3$ and $5x + 3 < 5$
The combined form joins two inequalities with 'and'.

11. C. 40
Square both sides: $2x + 1 = 81$, so $x = 40$. Check: $\sqrt{81} = 9$.

12. C. is less than or equal to
≤ means less than or equal to.

13. A. $x < 3$
Subtract 5 from both sides to get $x < 3$.

14. C. {5/3, −3}
$3x + 2 = 7$ gives $x = 5/3$. $3x + 2 = -7$ gives $x = -3$.

15. D. $x - 5 \geq -1$
Adding 5 to both sides of $x - 5 \geq -1$ gives $x \geq 4$.

16. **A. equivalent equations**
For example, 2x + 3 = 4 and 2x = 1 are equivalent.

17. **A. xy = 14**
xy = 14 has a product of two variables.

18. **D. x = 7 satisfies it**
Squaring gives x − 3 = 4, so x = 7. Check: √4 = 2.

19. **C. |a||b|**
The absolute value of a product is the product of the absolute values.

20. **A. x ≤ −4**
Dividing by −3 reverses the sign: x ≤ −4.

21. **D. exactly one solution, x = 0**
Only 0 is at distance 0 from 0.

22. **A. ax + b < 0, where a ≠ 0**
The standard form uses ax + b < 0 (or > 0, ≤ 0, ≥ 0) with a ≠ 0.

23. **A. x < 0**
For a negative x, −x is positive, so |x| = −x.

24. **B. 4 > 2**
Multiplying by a negative number reverses the sign: (−4)(−1) = 4 and (−2)(−1) = 2, so 4 > 2.

25. **D. at least one of its inequalities is true**
With 'or', one true inequality is enough.

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