ExamPath

CLASS 9 MATHEMATICS · FBISE · UNIT 5

Unit 5: Linear Equations and Inequalities — 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. The solution set of two inequalities joined by 'or' is the:

(A) union of the two solution sets
(B) intersection of the two solution sets
(C) empty set always
(D) first solution set only

2. If |a| = |b|, what is true about a and b?

(A) They are equal only
(B) They are equal or opposite
(C) One of them is zero
(D) They are opposite only

3. What does 4 < 2x + 3 < 10 mean?

(A) It is an equation
(B) It has no solution
(C) Both 4 < 2x + 3 and 2x + 3 < 10 must hold
(D) Either 4 < 2x + 3 or 2x + 3 < 10 holds

4. The solution set of two inequalities joined by 'and' is the:

(A) difference of the two sets
(B) intersection of the two solution sets
(C) complement of the two sets
(D) union of the two solution sets

5. Solve 2x + 3 > 7 or 4x − 1 < 3.

(A) 1 < x < 2
(B) x > 1
(C) x > 2 or x < 1
(D) x > 2 and x < 1

6. An inequality that uses only the symbols < or > is called:

(A) an equivalent inequality
(B) a strict inequality
(C) a compound inequality
(D) a linear equation

7. Why does √(3y + 1) = −2 have no solution in real numbers?

(A) 3y + 1 is always zero
(B) y must be negative
(C) A square root cannot equal a negative number
(D) Squaring gives −4

8. A student solves −2x < 6 and writes x < −3. What is wrong?

(A) The sign must be reversed, so x > −3
(B) Nothing is wrong
(C) The answer should be x < 3
(D) 6 should be subtracted first

9. A root found after squaring that does not satisfy the original equation is called:

(A) an extraneous root
(B) a rational root
(C) a double root
(D) an equivalent root

10. Why is 5x − 3 = 12 equivalent to 5x = 15?

(A) Dividing by 5 changes the solution
(B) x is multiplied by 12
(C) 3 and 12 are equal
(D) Adding 3 to both sides keeps the same solution

11. Solve |2x + 5| = 11.

(A) {3, −8}
(B) {3}
(C) {−3, 8}
(D) {8, −8}

12. Solve the compound inequality x − 5 ≥ −1 and x + 3 ≤ 10.

(A) x ≥ 4 or x ≤ 7
(B) 4 ≤ x ≤ 7
(C) x ≥ 7
(D) x ≤ 4

13. Why does 2x + 3 = 2x + 5 have no solution?

(A) x must be zero
(B) It is non-linear
(C) It has two solutions
(D) Subtracting 2x gives 3 = 5, which is false

14. Why does |x| + 7 = 3 have no solution?

(A) The bars should be removed
(B) It has two solutions
(C) x must be 4
(D) It gives |x| = −4, and an absolute value cannot be negative

15. If k < 0 and x < y, why is kx > ky?

(A) Multiplication always increases values
(B) x and y are equal
(C) Multiplying by a negative number reverses the inequality
(D) k is always positive

16. To solve 3x/5 − 1/2 = x/4 + 1, why do we multiply every term by 20?

(A) 20 is the solution

(B) 20 removes the variable

(C) 20 is the coefficient of x

(D) 20 is the LCM of 5, 2 and 4, so it clears the fractions

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17. If |x| = k and k < 0, the solution set is:

(A) φ

(B) {k, −k}

(C) {k}

(D) {0}

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18. Solve 3x/5 − 1/2 = x/4 + 1.

(A) 7/30

(B) 30/7

(C) −30/7

(D) 30

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19. Which value of x makes both x + 3 > 5 and x − 1 < 6 true?

(A) x = 1

(B) x = 8

(C) x = 2

(D) x = 4

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20. An equation |ax + b| = c with c > 0 is equivalent to:

(A) ax + b = c and ax + b = −c

(B) ax + b = c^2

(C) ax + b = c or ax + b = −c

(D) ax + b = c only

Answer key

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

Explanations

1. A. union of the two solution sets
With 'or', a number can satisfy either one or both inequalities.

2. B. They are equal or opposite
Both are the same distance from 0, so a = b or a = −b.

3. C. Both 4 < 2x + 3 and 2x + 3 < 10 must hold
The combined form is the same as a compound inequality joined by 'and'.

4. B. intersection of the two solution sets
With 'and', a number must satisfy both inequalities.

5. C. x > 2 or x < 1
The first gives x > 2 and the second gives x < 1. With 'or', we join the two sets.

6. B. a strict inequality
Strict inequalities do not include equality.

7. C. A square root cannot equal a negative number
After isolating the radical, it equals a negative number. A principal square root is never negative.

8. A. The sign must be reversed, so x > −3
Dividing both sides by −2 reverses the inequality: x > −3.

9. A. an extraneous root
Such a root is extraneous, and it is rejected.

10. D. Adding 3 to both sides keeps the same solution
Adding the same number to both sides gives an equivalent equation with the same solution.

11. A. {3, −8}
2x + 5 = 11 gives x = 3. 2x + 5 = −11 gives x = −8.

12. B. 4 ≤ x ≤ 7
The first gives x ≥ 4 and the second gives x ≤ 7. 'And' means both, so 4 ≤ x ≤ 7.

13. D. Subtracting 2x gives 3 = 5, which is false
The variable cancels and leaves a false statement, so no value of x works.

14. D. It gives |x| = −4, and an absolute value cannot be negative
Subtracting 7 gives |x| = −4, which is impossible.

15. C. Multiplying by a negative number reverses the inequality
Multiplying both sides by a negative number reverses the direction of the sign.

16. **D. 20 is the LCM of 5, 2 and 4, so it clears the fractions**
The LCM of the denominators makes every term whole without changing the solution.

17. **A. φ**
An absolute value is never negative, so there is no solution.

18. **B. 30/7**
Multiply by 20: 12x − 10 = 5x + 20. So 7x = 30 and x = 30/7.

19. **D. x = 4**
The first gives x > 2 and the second gives x < 7. Only 4 lies between 2 and 7.

20. **C. ax + b = c or ax + b = −c**
The quantity inside the bars can be c or −c, so we solve two equations.

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