Inequalities and Their Solutions

Mathematics · Practice Test · 20 Questions

1. Which point satisfies $x^2 + y <= 10$?

A) (3, 4)
B) (1, 2)
C) (4, 3)
D) (5, 0)

2. Which symbol indicates that endpoints are included in a number line solution?

A) Open circles at boundary points
B) Closed circles at boundary points
C) Arrows pointing outwards
D) Dashed lines

3. Why does $x^2 - 4 > 0$ produce two separate intervals?

A) Values beyond both roots satisfy the inequality.
B) Values between roots satisfy only the inequality.
C) The inequality is only defined for positive values.
D) The square root of the constant is an integer.

4. Why are brackets used in the interval [-3, 3]?

A) Endpoints are included in the solution.
B) Endpoints are excluded from the solution.
C) The interval represents only integers.
D) The interval is symmetric around zero.

5. Which values of x satisfy the condition $x^2 - 25 < 0$?

A) $x < -5$ or $x > 5$
B) $-5 < x < 5$
C) $x < -5$
D) $x > 5$

6. Why does $x^2 - 36 < 0$ use closed circles at -6 and 6?

A) The endpoints are outside the graph.
B) The endpoints satisfy the inequality.
C) The inequality is undefined at the endpoints.
D) The roots are imaginary.

7. Which set-builder notation represents (-3, 3)?

A) {x | -3 < x < 3}
B) {x | x < -3 or x > 3}
C) {x | -3 <= x <= 3}
D) {x | x <= -3 or x >= 3}

8. Which interval represents the solution of $x^2 - 100 < 0$?

A) (-10, 10]
B) (-10, 10)
C) [-10, 10]
D) (-?, -10) U (10, ?)

9. Which solution set satisfies $x^2 - 9 < 0$?

A) x < -3 or x > 3
B) -3 < x < 3
C) x <= -3 or x >= 3
D) x = -3 or x = 3

10. Which interval represents all values less than -2?

A) [-2, ?)
B) (-?, -2)
C) (-2, ?)
D) (-?, -2]

11. Which graph represents the inequality y < x - 9?

A) A shaded region beside a line
B) A shaded region below a parabola
C) A shaded region below a line
D) A shaded region above a line

12. A bridge remains stable when $x^2 - 64 < 0$. Which interval represents stability?

A) Values from -8 through 8
B) Values beyond -8 and 8
C) Only values greater than 8
D) Only values less than -8

13. Which notation represents the set {x | x < -2}?

A) (-?, -2]
B) (-?, -2)
C) [-2, ?)
D) (-2, ?)

14. Which statement correctly compares $x^2 - 16 < 0$ and $x^2 - 16 > 0$?

A) Their graphs have different vertices.
B) Their solution intervals are complementary.
C) They have the same boundary equations.
D) They both include the boundary points in their solutions.

15. Which equation forms the boundary of $x^2 + y <= 16$?

A) $x - y = 16$
B) $x^2 + y = 16$
C) $x + y^2 = 16$
D) $x^2 + y^2 = 16$

16. Why is the boundary dashed for $x + y < 9$?

A) Because the graph is always decreasing
B) Because the boundary is not included
C) Because the inequality is strict
D) Because the y-intercept is positive

17. Why are brackets used in [-5, 5]?

A) -5 and 5 are excluded from the solution
B) -5 and 5 are included in the solution
C) The interval represents only negative values
D) The interval represents only positive values

18. Why is the solution of $x^2 - 25 = 0$ written as two intervals?

A) Values outside the -5 and 5 satisfy the inequality.
B) Values inside the -5 and 5 satisfy the inequality.
C) The inequality is undefined at -5 and 5.
D) The roots are equal.

19. Which notation is commonly used to describe solution sets of inequalities?

A) Interval notation
B) Scientific Notation
C) Set-builder notation
D) Standard notation

20. What are the solutions of $x^2 - 64 >= 0$?

A) (-8, 8)
B) (-?, -8] U [8, ?)
C) [-8, 8]
D) (-?, -8) U (8, ?)