

Quadratic Inequalities and Interval Notation

Mathematics · Practice Test · 30 Questions

1. Which point satisfies $x^2 + y \leq 16$?

- A) (3,4)
- B) (2,5)
- C) (4,4)
- D) (3,8)

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

- A) Open circle
- B) Closed circle
- C) Dashed line
- D) Arrow

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

- A) Values between roots satisfy
- B) Values beyond both roots satisfy
- C) Endpoints are included
- D) None of the above

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

- A) Endpoints are included
- B) Endpoints are excluded
- C) Only negative values are included
- D) The set is infinite

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

- A) $\{x | x < -3 \text{ or } x > 3\}$
- B) $\{x | -3 < x < 3\}$
- C) $\{x | -3 \leq x \leq 3\}$
- D) $\{x | x < 3\}$

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

- A) $(-10, 10)$
- B) $[-10, 10]$
- C) $(-10, 10]$
- D) $[-10, 10)$

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

- A) $x<-3$ or $x>3$
- B) $-3<x<3$
- C) $x\leq-3$ or $x\geq3$
- D) $-3\leq x\leq3$

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

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

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

- A) The graph is decreasing
- B) The boundary is not included
- C) The graph is a parabola
- D) The values are positive

10. Which student uses the correct reasoning when graphing $x^2+y>16$?

- A) Boundary is solid
- B) Boundary is dashed because equality is excluded
- C) Boundary is dashed because it is a parabola
- D) Boundary is solid because it is a circle

11. Which interval notation represents all values between -5 and 5 without including endpoints?

- A) $[-5, 5]$
- B) $(-5, 5)$
- C) $(-5, 5]$
- D) $[-5, 5)$

12. A drone may fly where $x^2+y<18$. Which point is permitted?

- A) (4,4)
- B) (3,8)
- C) (5,0)
- D) (2,15)

13. Why does $x^2+4<0$ have no real solution?

- A) Square values cannot be negative
- B) Critical values are roots
- C) The parabola opens downward
- D) The graph does not exist

14. Which inequality has the solution set $(-4, 4)$?

- A) $x^2 - 16 < 0$
- B) $x^2 - 16 > 0$
- C) $x^2 + 16 < 0$
- D) $x^2 + 16 > 0$

15. Which symbol indicates that endpoints are excluded from a number line solution?

- A) Closed circle
- B) Open circle
- C) Brackets
- D) Solid line

16. Which interval solves $x^2 - 49 < 0$?

- A) $(-7, 7)$
- B) $(-\infty, -7) \cup (7, \infty)$
- C) $[-7, 7]$
- D) $(-\infty, -7] \cup [7, \infty)$

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

- A) Scientific Notation
- B) Interval notation
- C) Roman numerals
- D) Binary code

18. Which notation represents all real numbers greater than 3?

- A) $(3, \infty)$
- B) $[3, \infty)$
- C) $(-\infty, 3)$
- D) $(-\infty, 3]$

19. What are the solutions of $x^2 - 64 \geq 0$?

- A) $(-8, 8)$
- B) $(-\infty, -8] \cup [8, \infty)$
- C) $[-8, 8]$
- D) $(-\infty, -8) \cup (8, \infty)$

20. Why should a test point be substituted into an inequality?

- A) To identify the correct shaded region
- B) To calculate the vertex
- C) To find the roots
- D) To draw the axis

21. Which method is most appropriate for verifying if a point satisfies a quadratic inequality?

- A) Measure coordinates
- B) Substitute coordinates into inequality
- C) Guessing
- D) Visual estimation

22. A park allows locations satisfying $x^2+y \leq 20$. Which point meets the condition?

- A) (4,4)
- B) (2,18)
- C) (5,1)
- D) (3,12)

23. Which point does not satisfy $x^2+y < 9$?

- A) (1,2)
- B) (0,1)
- C) (2,4)
- D) (1,1)

24. How are critical values related to solution intervals?

- A) They are midpoints
- B) They are boundaries
- C) They are always zero
- D) They are always negative

25. Which explanation correctly identifies the solution region of $x^2+y > 25$?

- A) Region below the curve
- B) Region above the curve
- C) Region on the curve
- D) No region

26. Which student uses the correct reasoning to solve $x^2-81 > 0$?

- A) Solution between values
- B) Solution outside critical values
- C) Solution is the root
- D) Solution is empty

27. What are the solutions of the quadratic inequality $x^2+x-6 < 0$?

- A) $x \leq -3$ or $x \geq 2$
- B) $-3 < x < 2$
- C) $x < -3$ or $x > 2$
- D) $x \leq -3$

28. Which quadratic inequality has the point (2, 5) as a solution?

- A) $x^2+y>12$
- B) $x^2+y\leq 10$
- C) $x^2+y<5$
- D) $x^2+y>20$

29. Which solution set satisfies $x^2-1>0$?

- A) $(-\infty, -1) \cup (1, \infty)$
- B) $(-1, 1)$
- C) $(-\infty, -1] \cup [1, \infty)$
- D) $[-1, 1]$

30. Which observation correctly compares $x^2+y<16$ and $x^2+y\leq 16$?

- A) Only one graph changes the axis
- B) Only one graph includes the boundary
- C) They are identical
- D) They have different roots