

Quadratic Inequalities Mastery

Mathematics · Answer Key · 30 Questions

1. Which point satisfies $x^2 + y \leq 10$?

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

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

- A) Closed circles
- B) Open circles**
- C) Brackets
- D) Solid lines

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

- A) Endpoints are included**
- B) Endpoints are excluded
- C) Values are negative
- D) Values are infinite

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

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

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

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

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

- A) $[-2, \infty)$
- B) $(-\infty, -2)$**
- C) $(-2, 0)$
- D) $(2, \infty)$

7. Why is the boundary dashed for $x^2 + y < 9$?

A) Graph is decreasing

B) Boundary is not included

C) It is a parabola

D) It is a line

8. Which notation represents the set $\{x|x < -2\}$?

A) $(-?, -2]$

B) $(-?, -2)$

C) $[-2, ?)$

D) $(-2, ?)$

9. Which equation forms the boundary of $x^2 + y \leq 16$?

A) $x - y = 16$

B) $x^2 + y = 16$

C) $x + y = 16$

D) $x^2 + y^2 = 16$

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

A) Square values cannot be negative

B) Critical values are repeated

C) It has no roots

D) It is a linear equation

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

A) $x^2 - 16 < 0$

B) $x^2 - 16 > 0$

C) $x^2 + 16 < 0$

D) $x - 4 < 0$

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

A) (4, 4)

B) (3, 8)

C) (5, 5)

D) (6, 0)

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

A) Open circle

B) Closed circle

C) Dashed line

D) Arrow

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

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

15. Which method is most appropriate for verifying whether a point satisfies a quadratic inequality?

- A) Measure coordinates
- B) Substitute coordinates**
- C) Graph only
- D) Guessing

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

- A) $(1, 1)$
- B) $(0, 0)$
- C) $(3, 2)$**
- D) $(1, 0)$

17. How are critical values related to solution intervals?

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

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

- A) Below the curve
- B) Above the curve**
- C) Inside the circle
- D) On the line

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

- A) Solution is between roots
- B) Solution is outside roots**
- C) Solution is zero
- D) Solution is undefined

20. 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) $x < -3$
- D) $x > 2$

21. 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) $x^2 + y > 20$

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

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

23. Which notation represents all values between -4 and 4 excluding endpoints?

- A) $(-4, 4)$**
- B) $[-4, 4]$
- C) $(-?, -4)$
- D) $(4, ?)$

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

- A) One includes the boundary**
- B) One is a line
- C) One is a parabola
- D) No difference

25. Why is shading used on a number line graph?

- A) Show variables
- B) Indicate solution regions**
- C) Decoration
- D) Show axes

26. Which inequality symbol indicates that the endpoint values are included?

- A) $>$
- B) $<$
- C) $\leq$**
- D) $\neq$

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

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

28. Which interval represents all real numbers greater than 3?

A) (3, ?)

B) [3, ?)

C) (-?, 3)

D) (-?, 3]

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

A) Identify correct region

B) Calculate boundary

C) Find roots

D) Simplify equation

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

A) (-7, 7)

B) (-?, -7)

C) (7, ?)

D) [-7, 7]