Quadratic Inequalities and Interval Notation

Mathematics · Answer Key · 30 Questions

1. Which point satisfies $x^2+y<=16$?

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

D) $-3<=x<=3$

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) (-?, -7) U (7, ?)

C) [-7, 7]

D) (-?, -7] U [7, ?)

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, ?)

B) [3, ?)

C) (-?, 3)

D) (-?, 3]

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

A) (-8, 8)

B) (-?, -8] U [8, ?)

C) [-8, 8]

D) (-?, -8) U (8, ?)

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 $x^2+y<=20$. 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) $x<=-3$ or $x>=2$
B) $-3<x<2$
C) $x<-3$ or $x>2$
D) $x<=-3$

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

A) $x^2+y>12$

B) $x^2+y<=10$

C) $x^2+y<5$

D) $x^2+y>20$

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

A) (-?, -1) U (1, ?)

B) (-1, 1)

C) (-?, -1] U [1, ?)

D) [-1, 1]

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

A) Only one graph changes the axis

B) Only one graph includes the boundary

C) They are identical

D) They have different roots