# Inequalities and Their Solutions

Mathematics · Answer Key · 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, ?)