# Relation in the Sequence of Odd Numbers Between Consecutive Square Numbers

# **Understanding the Topic**

- Square numbers are the result of multiplying a number by itself.
- The difference between two consecutive square numbers is always an odd number.
- These odd numbers follow a clear pattern: 3, 5, 7, 9, and so on.
- As we go from one square number to the next, we are adding the next odd number.
- This pattern helps us find square numbers and understand number relationships better.

### **Important Points to Remember**

- Square of 1 = 1, square of  $2 = 4 \rightarrow$  difference is 3 (odd number).
- Square of 2 = 4, square of 3 = 9  $\rightarrow$  difference is 5 (odd number).
- The difference between n<sup>2</sup> and (n + 1)<sup>2</sup> is always (2n + 1), which is an odd number.
- These differences form a sequence of odd numbers.
- Helps in identifying square numbers without direct multiplication.
- Useful for mental math and finding missing square numbers in a series.

#### **Examples with Solutions**

1. Identify the Odd Difference

**Question:** What is the difference between  $3^2$  and  $2^2$ .

**Solution:** 9 - 4 = 5. 5 is an odd number.

2. Continue the Pattern

**Question:** Find the difference between  $5^2$  and  $4^2$ .

**Solution:** 25 – 16 = 9. 9 is the next odd number after 7.

3. Use the Rule (2n + 1)

**Question:** What is the difference between  $6^2$  and  $5^2$  using the formula.

**Solution:** 2 × 5 + 1 = 10 + 1 = 11. So, 36 - 25 = 11.

4. Reverse Thinking

**Question:** If the difference between two square numbers is 7, what are the numbers.

**Solution:**  $3^2 = 9$  and  $4^2 = 16 \rightarrow 16 - 9 = 7$ . So, numbers are  $3^2$  and  $4^2$ .

5. Square Number Check

**Question:** If 49 is a square number, what is the next square number and what is the difference.

**Solution:** Next square is 64 ( $8^2$ ). Difference is 64 – 49 = 15 (odd number).

# **Summary Points**

- Square numbers grow by adding odd numbers in sequence.
- The difference between consecutive square numbers is always odd.
- Formula for the difference is (2n + 1) where n is the smaller number.
- Pattern of differences: 3, 5, 7, 9, 11...
- Understanding this pattern helps in mental calculations and number sense.