Detailed Explanation of Number Series for MAH MCA CET Exam

1. Understanding Number Series

A **number series** is a sequence of numbers following a specific pattern. To solve questions, you need to **identify the pattern** and apply it to find the missing number.

---

2. Common Types of Number Series and How to Solve Them

(A) Arithmetic Series (Difference-Based)

- The **difference** between consecutive numbers is **constant**.
- **Formula:** an=a1+(n−1)×da_n = a_1 + (n-1) \times d
    - ana_n = nth term
    - a1a_1 = first term
    - dd = common difference

☑ **Example 1: 3, 7, 11, 15, ?**
Pattern: +4 (3+4=7, 7+4=11, ...)
Answer: 19

☑ **Example 2: 50, 45, 40, 35, ?**
Pattern: -5 (50-5=45, 45-5=40, ...)
Answer: 30

(B) Geometric Series (Multiplication-Based)

- Each term is obtained by **multiplying** the previous term by a constant.
- **Formula:** an=a1×r(n−1)a_n = a_1 \times r^{(n-1)}
    - ana_n = nth term
    - rr = common ratio

☑ **Example 1: 3, 6, 12, 24, ?**
Pattern: ×2 (3×2=6, 6×2=12, ...)
Answer: 48

☑ **Example 2: 100, 50, 25, 12.5, ?**
Pattern: ÷2 (100 ÷ 2 = 50, 50 ÷ 2 = 25, ...)
Answer: 6.25

(C) Square and Cube Series

- Based on **squares** or **cubes** of numbers.

☑ **Example 1: 1, 4, 9, 16, ?, 36**
Pattern: $1^2, 2^2, 3^2, 4^2, 5^2, 6^2$
Answer: 25 (5^2)

☑ **Example 2: 1, 8, 27, 64, ?**
Pattern: $1^3, 2^3, 3^3, 4^3, 5^3$
Answer: 125 (5^3)

(D) Fibonacci Series

- Each term is the **sum of the two previous terms**.

☑ **Example: 1, 1, 2, 3, 5, 8, ?**
Pattern: (1+1=2, 1+2=3, 2+3=5, ...)
Answer: 13

(E) Alternating Series

- Two or more **different patterns alternate**.

☑ **Example: 2, 6, 3, 7, 4, 8, ?**
Pattern: (+4, -3, +4, -3, ...)
Answer: 5

☑ **Example: 1, 2, 4, 8, 16, ?, 64**
Pattern: (×2, ×2, ×2, ×2, ...)
Answer: 32

(F) Mixed Pattern Series

- A **combination** of different logic.

☑ **Example: 2, 3, 6, 11, 18, ?**
Pattern: (+1, +3, +5, +7, ...)
Answer: 27

☑ **Example: 1, 3, 6, 10, 15, ?**
Pattern: +2, +3, +4, +5, ...
Answer: 21

---

3. MCQs with Solutions

1 Find the missing number:
5, 10, 20, 40, ?
a) 50
b) 60
c) 80

d) 100
☑ **Answer: c) 80** (×2 pattern)

2 Find the missing term:
2, 6, 12, 20, 30, ?
a) 40
b) 41
c) 42
d) 43
☑ **Answer: c) 42** (+4, +6, +8, +10, ...)

3 Find the missing number:
3, 9, 27, ?, 243
a) 54
b) 81
c) 108
d) 144
☑ **Answer: b) 81** (×3 pattern)

4 Find the missing term:
1, 4, 9, 16, ?, 36
a) 20
b) 24
c) 25
d) 30
☑ **Answer: c) 25** (Squares pattern)

5 Identify the missing number:
1, 1, 2, 3, 5, 8, ?
a) 10
b) 11
c) 12
d) 13
☑ **Answer: d) 13** (Fibonacci series)

---

4. Tricks to Solve Number Series Fast

☑ **Step 1:** Check for a common **difference** (arithmetic).
☑ **Step 2:** Look for **multiplication** patterns (geometric).
☑ **Step 3:** Identify **squares or cubes**.
☑ **Step 4:** Check for **Fibonacci or alternating** sequences.
☑ **Step 5:** Practice daily with **mock tests & time yourself**.

---

5. Practice Questions for You

Try these questions and let me know your answers! 😊

1 Find the missing number:
10, 20, 30, ?, 50

2 What comes next?
1, 4, 9, 16, ?, 36

3 Identify the missing number:
2, 6, 18, ?, 162

4 What comes next in this series?
1, 3, 7, 15, ?, 63

5 Find the missing term:
5, 15, 45, ?, 405

Would you like **more MCQs, shortcuts, or topic-wise practice sets**? 😊