**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:** **1², 2², 3², 4², 5², 6²**  
**Answer:** **25 (5²)**

✅ **Example 2:** **1, 8, 27, 64, ?**  
**Pattern:** **1³, 2³, 3³, 4³, 5³**  
**Answer:** **125 (5³)**

**(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**

**1️⃣ Find the missing number:**  
**5, 10, 20, 40, ?**  
a) 50  
b) 60  
c) 80  
d) 100  
✅ **Answer:** **c) 80** (×2 pattern)

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

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

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

**5️⃣ 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! 😊

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

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

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

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

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

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