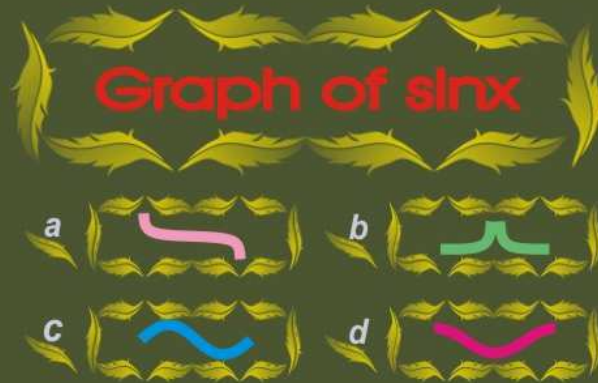


# HOW TO TEACH MATH MCQs

M. MAQSOOD ALI



BOOK - 1

**Chapter 10****MATHEMATICAL INDUCTION**

Don't use "Mathematical Induction", for MCQs from chapter MATHEMATICAL INDUCTION.

There is a series to  $n$  terms on L.H.S.

To check which option is correct, put either  $n = 1, n = 2, n = 3$  or  $n = 4$ , both sides one by one.

**MCQ- 1:**

$$1 + 3 + 5 + \dots + (2n - 1) = ?$$

- (a)  $n(2n - 1)$       (b)  $n^2$       (c)  $n^3$       (d)  $2n$

**Solution:**

For  $n = 2$

$$\text{L. H. S} = 1 + 3 = 4$$

Putting  $n = 2$  one by one in four options

$$(a) 2(2 \times 1 - 1) = 2(1) = 2 \quad (\text{no})$$

$$(b) n^2 = 2^2 = 4 \quad (\text{yes})$$

$$(c) 2^3 = 8 \quad (\text{no})$$

$$(d) 2(2) = 4 \quad (\text{yes})$$

Options (b) and (d) are same and one of them will be correct.

Now check for  $n = 1$  or  $n = 3$ :

For  $n = 1$ :

$$\text{L. H. S} = 1$$

$$(b) 1^2 = 1 \quad (\text{yes})$$

$$(d) 2 \times 1 = 2 \quad (\text{no})$$

The answer is (b).

**MCQ- 2:**

$$4 + 8 + 12 + \dots + 4n = ? \quad , \quad \forall n \in \mathbb{N}.$$

- (a)  $4n(n + 1)$     (b)  $2(n + 1)$     (c)  $n^2(n + 1)$     (d)  $2n(n + 1)$

**Solution:**

Check for either  $n = 1, n = 2$  or any natural number. If two, three or all options give same correct answer, then check for any other natural number.

For  $n = 3$ :

$$\text{L.H.S} = 4 + 8 + 12 = 24$$

Now check four options.

$$(a) 4 \times 3(3 + 1) = 48$$

$$(b) 2(3 + 1) = 8$$

$$(c) 3^2(3 + 1) = 36$$

$$(d) 2 \times 3(3 + 1) = 24$$

The answer is (d).

**EXERCISE-1**

(1)  $1 + 4 + 7 + \dots + (3n - 2) = ?$

- (a)  $\frac{n}{2}(5n + 3)$     (b)  $\frac{n}{4}(5n - 1)$     (c)  $\frac{n}{4}(3n + 1)$     (d)  $\frac{n}{2}(3n - 1)$

(2)  $2 + 9 + 16 + \dots + (7n - 1) = ?$

- (a)  $\frac{n}{4}(5n + 3)$     (b)  $\frac{n}{2}(7n - 3)$     (c)  $\frac{n}{3}(7n - 1)$     (d)  $\frac{n}{2}(5n + 1)$

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