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MATHEMATICS · JEE MAIN

Mathematical Induction

Previous Year Questions with answers

4 questions · **4** papers · **2002–2019** · newest paper first

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What is in this PDF: every Mathematical Induction question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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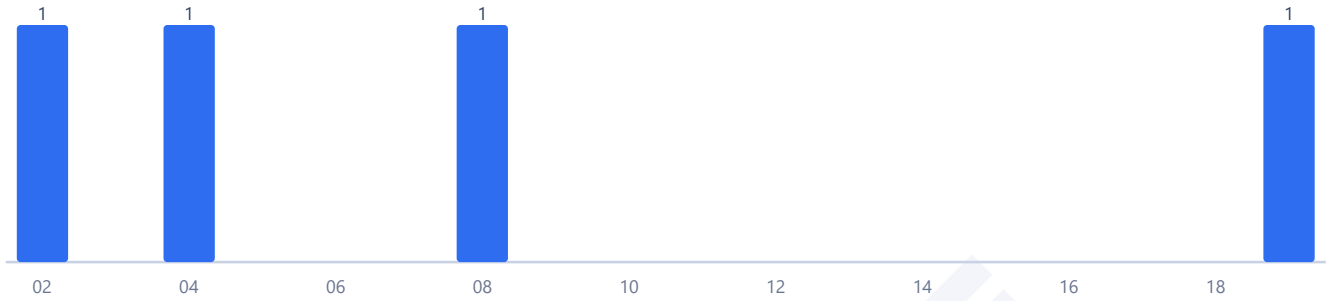
Chapter at a glance

0%	4	1 of 162	4 / 0
of Mathematics questions, 2019–2026	questions, 2002–2019	papers asked it, 2019–2026	MCQ / numerical, 2002–2019

Questions per year



Counts are the questions we hold: 4 in 4 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2002–2019)

Principle of Mathematical Induction — 4

How often it comes up

Mathematical induction was formerly in the Class 11 curriculum before being removed in 2024, placing it at rank 28 among the 29 chapters in the subject. Between 2019 and 2026, the examination included only 1 question from this chapter across 162 papers, representing 0.0 percent of all mathematics questions. It appeared in 1 of those 162 papers and was not asked in 2020, 2021, 2022, 2023, 2024, 2025, or 2026. In the 2024 to 2026 period following its formal excision, 0 questions appeared across 58 papers, averaging 0.0 questions per paper with a 0.0 percent subject share. Comparing the earlier 2002 to 2018 share of 0.2 percent to 2024 to 2026 shows that its share is about the same, and comparing 2019 to 2026 with 2024 to 2026 also shows it is about the same. Across the entire 2002 to 2019 historical record of 200 papers, 4 questions appeared across 4 papers, with 0 numerical answer questions between 2019 and 2026.

Even prior to its formal deletion from the NTA curriculum in 2024, mathematical induction rarely appeared in the exam. Across the 162 papers conducted between 2019 and 2026, it was featured in only a single shift in January 2019. Zero questions appeared in any subsequent year, confirming that candidates preparing for the modern examination cycle should bypass this unit entirely.

Because multiple-choice questions allow options to be tested directly by substituting small integer values like one, two, or three, formal inductive proofs have never been suitable for objective testing.

Most-asked topics

Every historical problem in this chapter falls under a single classification:

1. **Principle of Mathematical Induction (1 question, 2019-2026; 4 total, last asked 2019)** Historical problems tested whether given statements about prime values, inequalities, or finite summation identities hold true for specific integer substitutions, or probed the logic of the inductive step from k to k plus one.

What the questions look like

The rare problems asked under mathematical induction followed simple testing formats:

- **Verification of Inductive Hypotheses**: Given a polynomial expression asserted to yield prime numbers, evaluating the proposition directly for small prime or integer inputs.

- **Statement Truth Analysis**: Assessing two propositions involving square root inequalities to identify which statement is valid.
- **Logical Fallacies in Induction**: Identifying the false step in an erroneous inductive argument claiming a false summation identity.

How to practise it

Because this chapter has been removed from the syllabus and was asked only once since 2019, students should spend zero revision time on it:

- **Do not practice standalone induction proofs**: Objective multiple-choice testing does not evaluate multi-step inductive write-ups.
- **Use small value testing in active chapters**: When working on sequences or binomial identities in active chapters, substituting small integers remains a useful check.

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Q1 JEE Main 2019 · 10 Jan · Shift 1 MCQ

Consider the statement: "$P(n) : n^2 - n + 41$ is prime". Then which one of the following is true?

(A) $P(3)$ is false but $P(5)$ is true
(B) Both $P(3)$ and $P(5)$ are false
(C) Both $P(3)$ and $P(5)$ are true
(D) $P(5)$ is false but $P(3)$ is true

Answer: (C) Both $P(3)$ and $P(5)$ are true · Key from source paper

Q2 AIEEE 2008 MCQ

Statement - 1: For every natural number $n \geq 2$, $\frac{1}{\sqrt{1}} + \frac{1}{\sqrt{2}} + \ldots + \frac{1}{\sqrt{n}} > \sqrt{n}$. Statement -2 : For every natural number $n \geq 2$, $\sqrt{n(n+1)} < n + 1$.

(A) Statement -1 is false, Statement -2 is true
(B) Statement -1 is true, Statement -2 is true, Statement -2 is a correct explanation for Statement -1
(C) Statement -1 is true, Statement -2 is true; Statement -2 is not a correct explanation for Statement -1.
(D) Statement -1 is true, Statement -2 is false.

Answer: (C) Statement -1 is true, Statement -2 is true; Statement -2 is not a correct explanation for Statement -1. · Key from source paper

Q3 AIEEE 2004 MCQ

Let $S(K) = 1 + 3 + 5 + \ldots + (2K - 1) = 3 + K^2$. Then which of the following is true?

(A) $S(1)$ is correct
(B) Principle of mathematical induction can be used to prove the formula
(C) $S(K) \neq S(K + 1)$
(D) $S(K) \Rightarrow S(K + 1)$

Answer: (D) $S(K) \Rightarrow S(K + 1)$ · Key from source paper

Q4 AIEEE 2002 MCQ

If $a_n = \sqrt{7 + \sqrt{7 + \sqrt{7 + \ldots..}}}$ having n radical signs then by methods of mathematical induciton which is true

(A) $a_n > 7 \forall n \geq 1$

(B) $a_n > 3 \forall n \geq 1$

(C) $a_n < 4 \forall n \geq 1$

(D) $a_n < 3 \forall n \geq 1$

Answer: (C) $a_n < 4 \forall n \geq 1$ · Checked by our team

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