



Proof by Induction (MIEIC-TCOM-2020-21)

163

Responses

7.6

Average Score

Active

Status

1. When proving a statement $S(n)$ by induction, the base step (basis) always consider $n=0$ or $n=1$ (1 point)

74% of respondents (120 of 163) answered this question correctly.



2. In proof by induction, the proof for the base case(s) is not optional. (1 point)

92% of respondents (150 of 163) answered this question correctly.



3. In proof by induction, we always need to prove a large number of specific cases (1 point)
98% of respondents (158 of 162) answered this question correctly.

TRUE	4
FALSE	158 ✓



4. A proof by induction only allows us to prove theorems with equalities. (1 point)
84% of respondents (137 of 163) answered this question correctly.

TRUE	26
FALSE	137 ✓



5. When proving by induction a statement $S(n)$ that holds for every natural number $n \geq 0$: (1 point)
85% of respondents (138 of 163) answered this question correctly.

It is correct to consider for bas...	138 ✓
It is correct to consider for bas...	25



6. There are statements with more than one induction variable (e.g., two or more natural numbers) that can be proved by induction (1 point)

75% of respondents (120 of 161) answered this question correctly.

● TRUE 120 ✓
● FALSE 41



7. When proving by induction a statement $S(n)$, true for every natural number $n \geq 0$, one can use as basis a large natural number and then prove $S(k-1)$ assuming $S(k)$ is true. (1 point)

83% of respondents (134 of 161) answered this question correctly.

● TRUE 27
● FALSE 134 ✓



8. Can we prove by induction that $2^n \geq n+5$ for $n \geq 3$? (1 point)

88% of respondents (142 of 162) answered this question correctly.

● YES 142 ✓
● NO 20



9. Can we prove by induction the statement: if $x \geq 4$, then $2^x \geq x^2$? (1 point)

39% of respondents (64 of 163) answered this question correctly.

NO	15	
YES	64	✓
Depends if x represents natur...	84	



10. In a complete binary tree of height h (not considering the leaves), the number of internal nodes (sum of all nodes in the tree except for the leaves) of that tree equals $2h-1$. Consider we want to prove the truthfulness of the above statement. Which of the following options applies? (1 point)

48% of respondents (77 of 159) answered this question correctly.

To prove the statement we ne...	41	
We can prove the statement t...	77	✓
We cannot prove the stateme...	20	
We cannot prove the stateme...	21	

