

CoVe prompt and result :

Initial Response Generation: :

“ The student's answer is partially correct. They correctly identified that ϕ_1 is not a linear transformation and provided a correct explanation. They also correctly identified that ϕ_3 is a linear transformation and provided a correct explanation. However, the student made a mistake in evaluating ϕ_2 . They claimed that ϕ_2 is a linear transformation, but this is incorrect. The student failed to check the second condition of linearity. So, the student's conclusion that ϕ_2 is a linear transformation is incorrect.”

Verification Planning:

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'The student correctly identified that ϕ_1 is not a linear transformation and provided a correct explanation.'

'What are the properties of linearity that the student used to correctly identify that ϕ_1 is not a linear transformation?'

'The student correctly identified that ϕ_3 is a linear transformation and provided a correct explanation.'

'What are the properties of linearity and did the student prove them all to identify that ϕ_3 is a linear transformation?'

'The student made a mistake in evaluating ϕ_2 . They claimed that ϕ_2 is a linear transformation, but this is incorrect.'

'What is the second condition of linearity and did the student fail to check it for ϕ_2 ?'

'The student should have checked both conditions of linearity for each function: $\phi(f + g) = \phi(f) + \phi(g)$ and $\phi(kf) = k\phi(f)$.'

'What are the two conditions of linearity and did the student check them for each function?'

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Execution of Verifications:

“Question: What are the properties of linearity that the student used to correctly identify that ϕ_1 is not a linear transformation?

Answer: The properties of linearity that the student used to correctly identify that ϕ_1 is not a linear transformation are:

1. Additivity: $\phi(f + g) = \phi(f) + \phi(g)$...”

Adjustment of Final Response:

Prompt :

“Given the ORIGINAL_QUESTION and the ORIGINAL_RESPONSE, revise the ORIGINAL_RESPONSE (if applicable) such that it is consistent with information in VERIFIED_SOURCE.

Only keep consistent information and answer that still make sense with the VERIFIED_SOURCE.

<ORIGINAL_QUESTION>

{query}

<ORIGINAL_RESPONSE>

{base_response}

<VERIFIED_SOURCE>

{verify_results}

Final response:

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Final response :

*“The student's answer is partially correct. The student correctly identified that ϕ_1 is not a linear transformation and provided a correct explanation, demonstrating that ϕ_1 does not satisfy the property of additivity. The student also correctly identified that ϕ_3 is a linear transformation and provided a correct explanation, showing that ϕ_3 satisfies both properties of linearity, additivity and scalar multiplication. However, the student made a mistake in evaluating ϕ_2 . The student claimed that ϕ_2 is a linear transformation, but this is incorrect. The student failed to check the second property of linearity, which is scalar multiplication. For an application to be linear, it must satisfy both additivity and scalar multiplication. The student only checked for additivity in the case of ϕ_2 . In the case of ϕ_2 , if we consider a function f in E and a scalar k , $\phi_2(kf)(x) = (kf)(x^2) = k*f(x^2)$ which is not equal to $k*\phi_2(f)(x)$. Therefore, ϕ_2 does not satisfy the property of linearity and is not a linear transformation. The student should have checked both properties of linearity (additivity and scalar multiplication) for each application.”*