Questions: Multivariate chain rule

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Summary

A selection of questions for the study guide on the multivariate chain rule.

*Before attempting these questions, it is highly recommended that you read* [*Guide: Multivariate chain rule*](../studyguides/multivariatechainrule.qmd)*.*

## Q1

Let be a function where both and depend on an independent variable .

For each of the following, use the multivariate chain rule to find , expressing your answer in terms of only.

1.1. where and .

1.2. where and .

1.3. where and .

1.4. where and .

1.5. where and .

1.6. where and .

1.7. where and .

1.8. where and .

1.9. where and .

1.10. where and .

1.11. where and .

1.12. where and .

1.13. where and .

1.14. where and .

1.15. where and .

## Q2

Let be a function where both and depend on two independent variables and .

For each of the following, use the multivariate chain rule to find and , expressing your answers in terms of and only.

2.1. where and .

2.2. where and .

2.3. where and .

2.4. where and .

2.5. where and .

2.6. where and .

2.7. where and .

2.8. where and .

2.9. where and .

2.10. where and .

## Q3

Let be a function that depends on variables , where each is itself a function of .

For each of the following, use a tree diagram to write the multivariate chain rule, and find the resulting partial derivatives.

3.1. where

3.2. where

3.3. where

3.4. where

[After attempting the questions above, please click this link to find the answers.](../answers/as-multivariatechainrule.qmd)

## Version history and licensing

v1.0: initial version created 05/25 by Donald Campbell as part of a University of St Andrews VIP project.

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