Factsheet: Rules of calculus

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Summary

A list of common rules in calculus.

*Please note: clickable links lead to study guides where the rule is introduced.*

## Rules of differentiation

[**Limit definition of the derivative:**](../studyguides/introtodifferentiation.qmd) If is a continuous function, then (if it exists) the derivative is defined by

[**Sum/difference and constant rule:**](../studyguides/introtodifferentiation.qmd) If and are differentiable functions, then

[**Product rule:**](../studyguides/productrule.qmd) If ,

[**Quotient rule:**](../studyguides/quotientrule.qmd) If and , then

[**Chain rule:**](../studyguides/chainrule.qmd) If , then

where is the derivative of with respect to .

**Implicit differentiation:** If defines a function implicitly, then

where is the derivative of with respect to .

## Rules of integration

**Sum/difference and constant rules**: If are functions and is any number:

**Limit manipulation**: If is a function and are real numbers, then:

* for such that , then:
* if , then:

**Integration by substitution:** For an indefinite integral,

and for a definite integral

**Integration by parts:** For functions of :

**Integration of derivative over function:** For a function ,

## Version history

v1.0: created in 08/25 by tdhc.

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