Differentiation

Study Development Quickguide

## Simple differentiation

If where and are constants, then

For a function of the form we simply differentiate each term from left to right to get:

The differential of a constant is 0.

## Common differentiation rules

=

=

=

=

=

Differential of natural log: =

## The chain rule

=

## The product rule

= +

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## The quotient rule

=

## Equation of a tangent

To find the equation of a tangent at a point on a function:

1. Differentiate the function. This gives you an expression for the gradient of the function.
2. Calculate the gradient using the expression from step 1 at the point you want the tangent at. Do this by plugging in the x value given.
3. Write a new expression of the form: .
4. Use the x and y values of the point given to calculate .

## Turning points

To find a turning point:

1. Differentiate the function.
2. Equate the differential to 0 and solve for .
3. Substitute these values into your original function to find the corresponding values.

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