# M1M1 Summary Notes

**JMC Year 1, 2017/2018 syllabus**

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UNDER CONSTRUCTION

This document contains a bunch of definitions and techniques, sorted by category.

M1M1 is more about applying mathematical methods rather than proving theorems, so sly manipulation of mathematical techniques is crucial.

Boxes cover content in more detail.

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## 0.1 Fundamental Theorem of Calculus

The fundamental theorem of calculus defines the antiderivative $F(x)$ and shows the relation between differentiation and integration. It can be expressed in several different forms:

$$\frac{d}{dx}\int_a^x f(t)\ dt = f(x) \tag{1}$$

$$\int_a^b f(x)\ dx = F(b) - F(a) \tag{2}$$

Note that in equation 1, any lower bound $a$ and dummy variable $t$ can be picked, without affecting the validity of the theorem.