



# My Maths Cloud

## A Level Old Syllabus Vs New Syllabus

$(1+x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + \dots$   
 $y = e^{ax}$   
 $\frac{dy}{dx} = f'(x) e^{ax}$   
 $\Rightarrow \int f'(x) e^{ax} dx = e^{ax} + c$   
 $N(t) = \frac{ae^{kt}}{1+be^{kt}}$   
 $U_n = a + (n-1)d$   
 $S_n = \frac{n}{2} [2a + (n-1)d]$

$\sum_{i=1}^n i = \frac{n(n+1)}{2}$   
 $\frac{dy}{dx} = \frac{dy}{dt} \times \frac{dt}{dx}$   
 $\int y \frac{dx}{dt}$

$\text{Area} = \int_a^b f(x) dx$   
 $\sin 2x = \sin(x+x)$   
 $= \sin x \cos x + \cos x \sin x$   
 $= 2 \sin x \cos x$   
 $\sigma_x = \sqrt{\frac{\sum x^2}{n} - \bar{x}^2}$   
 $\bar{x} = \frac{\sum f x}{n}$

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## 1.1 Edexcel GCE, AQA, OCR

This used to be modular, but the syllabus changed for first teaching in 2017. Past papers are available from 2018 onwards. Often students ask why there is an A Level past paper available in 2018 when it is a two-year course. This is because some Further students take A Levels in their first year.

### 1.1.1 How Is The New Syllabus Different?

A Level:

Beforehand you could have just specialised in Statistics (S1 and S2) or just specialised in Mechanics (M1 and M2). Now the new syllabus for A levels forces you to cover both Statistics AND mechanics. This is not the case for Edexcel IAL and Cambridge though. You can still specialise.

Further:

Beforehand you could have picked from some of the regular A Level Modules for your Further Modules: S1, S2, M1, M2, D1, D2, whereas now you must choose from the Further options only.

In addition, Edexcel have made the interesting decision of allowing schools/students to choose only pure maths content for Further. The Further Pure options will include topics like number theory and group theory. So, 100% pure content is an option for Further but there are other options that include up to 50% applied content.

So, a student who chooses this pure only option would go through the whole of A Level maths having only done the equivalent amount of applied content as M1 & S1 in the old spec. This is quite different to the old Edexcel spec that required 50% applied content for Further. I'm not sure whether I like the idea of students starting a maths degree having done so little applied maths at A Level though!

### 1.1.2 New A Level Module Equivalence

- A Level
  - **C1 and C2 modules are like the new AS pure (not quite though as some topics like arithmetic and geometric series have been moved to year 2 now and also topics like exponentials and natural logarithm (ln) in the old C3 are now in the new AS)**
  - **C3 and C4 is very similar to New A2 pure**
  - **S1 is similar to the new AS stats**
  - **S2 is similar to the new A2 stats (S2 has much more in it though like continuous distributions, Poisson, Poisson approximation to Binomial, Normal approximation to Poisson etc)**
  - **M1 is mostly like the new Mechanics AS and A2 (with a few extra things added from old M2 such as non-constant acceleration, moments with ladders, hinges etc)**
- Further
  - **FP1- FP3 are roughly covered in the new Core Pure 1 and Core Pure 2. Most schools do Core Pure 1, Core Pure 2, FS1, FM1 and FM2. Only specialist schools offer FP1, FP2 and FS2. FP1 and FP2 offer topics such as groups and number theory which is taught at university.**

**The other difference is the latest syllabus has more modelling questions and definitely requires deeper thinking than the previous style of questions.**

### 1.1.3 Old Exam Format Pre 2018

- AS (3 modules – C1, C2 and any one out of M1, S1, D1)
- A Level (6 modules – C1,C2,C3,C4 and any two out of S1,S2,M1, M2, D1, D2)
- AS Further (3 modules – FP1 and any two of out of FP2, FP3, M1, M2, S1, S2 D1, D2)
- A Level Further Maths (6 modules – FP1, FP2 OR FP3 and any four out of FP2, FP3, M1, M2, M3, M4, M5 S1, S2, S3, S4 D1, D2)

So, under the old system, a student doing A Level and Further A Level sat 12 papers - C1, C2, C3, C4, FP1, FP2, FP3, FP4 and four papers on topics that include Statistics, Mechanic and/or Decision.

### 1.1.4 New Exam Format Post 2018

The papers names are slightly different for AQA and OCR, than Edexcel.

- AS
  - Edexcel: (2 papers - Paper 1 pure, Paper 2 statistics and mechanics)
  - AQA: (2 papers - Paper 1 pure and mechanics, Paper 2 pure and statistics)
  - OCR: (2 papers - Paper 1 pure and statistics, Paper 2 pure and mechanics)
- A Level
  - Edexcel: (3 papers - Paper 1 pure, Paper 2 pure, Paper 3 statistics and mechanics)
  - AQA: (3 papers - Paper 1 pure, Paper 2 mechanics, Paper 3 statistics)
  - OCR: (3 papers - Paper 1 pure, Paper 2 pure and statistics, Paper 3 pure and mechanics)
- AS Further
  - Edexcel: (2 papers- Core Pure and any one of FP1 AND FP2, FP1 AND FS1, FP1 AND FM1, FP1 AND D1, FS1 AND FM1, FS1 AND D1, FS1 AND FS2, FM1 AND D1, FM1 AND FM2, D1 AND D1)
  - AQA (2 papers – pure and any one out of Discrete AND Statistics, Statistics AND Mechanics, Mechanics AND Discrete)
  - OCR: (3 papers – Pure core and choose any 2 out of Statistics, Mechanics, Discrete, Additional Pure)
- A Level Further Maths
  - Edexcel: (4 papers - Core Pure 1, Core Pure 2, any one of FP1, FS1, FM1, D1 and then any one out of FP2, FS1, FM1, D1, FS2, FM2, D2)
  - AQA: (3 papers – Pure 1, Pure 2 and any 1 out of Discrete AND Statistics, Statistics AND Mechanics, Mechanics AND Discrete)
  - OCR: (4 papers – Pure Core 1, Pure Core 2 and choose any two out of Choose 2 of Statistics, Mechanics, Discrete, Additional Pure)

## 1.2 Edexcel IAL

This used to be modular and is still modular. The syllabus changed for first teaching in 2018. Past papers are available from 2020 onwards. (Note: P1 started in 2019)

### 1.2.1 New A Level Module Equivalence

**C12 is like C1 and C2 combined from above and C34 is like C3 and C4 combined. F1 is like FP1 etc. There is nothing equivalent to M4, M5 and S4 from Edexcel**

### 1.2.2 Old Exam Format Pre 2020

- AS (2 modules - C12 and any one out of M1,S1,D1)
- A Level (4 modules- C12, C34 and any one out of M1 AND S1, M1 AND D1, M1 AND M2, S1 AND D1, S1 AND S2)
- AS Further (2 modules – F1 and any one out of F2, F3, M1, M2, M3, S1, S2, S3, D1)
- A Level Further (4 modules- C12, C34, F1 and any one out of F2 or F3)

### 1.2.3 New Exam Format Post 2020

- AS (3 modules - P1, P2, and any one out of M1,S1,D1)
- A Level (6 modules- P1, P2, P3, P4, and any one out of M1 AND S1, M1 AND D1, M1 AND M2, S1 AND D1, S1 AND S2)
- AS Further (3 modules – FP1 and any one two out of FP2, FP3, M1, M2, M3, S1, S2, S3, D1)
- A Level Further (6 modules- FP1, FP2 or FP3, F1 and any four out of FP2, FP3, M1, M2, M3, S1, S2, S3, D1)

## 1.3 Cambridge

The syllabus changed for first teaching in 2019. Past papers are available from 2020 onwards.

### 1.3.1 New A Level Module Equivalence

A level no longer includes Mechanics 2 and Further has four papers instead of just two. Further maths is different from the other exam boards mentioned above as it is mandatory to do statistics AND mechanics.

### 1.3.2 Old Exam Format Pre 2020

- AS (2 modules - P1 and any one out of P2, M1, S1)
- A Level (4 modules- P1, P3 and any one out of M1 AND S1, M1 AND M2, S1 AND S2)
- AS Further - This was not an option before
- A Level Further (2 modules – P1 Pure and P2 Mechanics and Statistics)

### 1.3.3 New Exam Format Post 2020

There are four equally weighted exams (not necessarily taken at the end of the whole course) as follows:

- AS (2 modules – Any option out of P1 AND P2, P1 AND P4, P1 AND P5)
- A Level (4 modules- Any option out of P1 AND P3 AND P4 AND P5, P1 AND P3 AND P5 AND P6)
- AS Further (2 modules- Any option out of P1 AND P3, P1 AND P4)
- A Level Further (4 modules – Further Pure 1, Further Pure 2, Further Mechanics, Further Probability & Statistics)