

## PA Curriculum draft - Maths

### Basic Syllabus

#### Pre GCSE - in this order

- Basic addition, subtraction, multiplication, division
- Basic algebra ( $y = mx + c$ )
- Fractions ( $4/10 = 2/5$  and  $6/2 = 3/1$ )
- Brackets
- Indices
- BIDMAS
- Sketching curves ( e.g. draw a graph of  $y = x^2$ ,  $y = 3x + 4$ )

#### GCSE

- Anything in the video series coming up, focus heavily on algebra, differentiation (if it is in that syllabus), trigonometry, pythagoras theorem and that sort of work as it provides good return on investment
- Do at least some form of this work at least 5 days a week, but ideally every day and get good at applying it to abstract situations, people should look for their own questions on the internet as that is what I normally do. New questions are always popping up all over the place, and there is no point in me subscribing 1 place as that doesn't have enough questions

#### A level - non-further maths

- Same as GCSE with learning methodology, initially focus on trig, differentiation and fractions, then move integration which is the main skillset requirement. Finish off with differential equations, but if you are good at integration then differential equations should be easy.

#### A levels - further maths/1st year uni maths

- Same as A level with learning methodology, this time first focus on complex numbers and matrices, then focus on calculus after you are good at this.

#### Additional maths

- Integrating factor
- Laplace transform
- Fourier transform
- Fourier series
- Partial differential equations
- Differentiating under the integral sign (feynman technique)

#### Resources

## Pre gcse

Gcse (meant to be 14-16, but could probably be done to a good standard from about 12 years old)

- [https://www.youtube.com/c/ExamSolutions\\_Maths/playlists?view=50&sort=dd&shelf\\_id=9](https://www.youtube.com/c/ExamSolutions_Maths/playlists?view=50&sort=dd&shelf_id=9)
- <https://www.youtube.com/c/SimonDeacon/videos>
- These 2 links seem to be good resources, although youtube and google are useful for finding questions to do in general.

A level (meant to be 16-18 but I used to know a guy who got an A star when he was 14 years old)

- [https://www.youtube.com/c/ExamSolutions\\_Maths/playlists?view=50&sort=dd&shelf\\_id=8](https://www.youtube.com/c/ExamSolutions_Maths/playlists?view=50&sort=dd&shelf_id=8) general lessons
- <https://www.youtube.com/c/blackpenredpen/videos> the people on this channel are generally emotionally incontinent, but do lots of good calculus question videos.

A level further maths

- [https://www.youtube.com/c/ExamSolutions\\_Maths/playlists?view=50&flow=grid&shelf\\_id=12](https://www.youtube.com/c/ExamSolutions_Maths/playlists?view=50&flow=grid&shelf_id=12) lessons
- Go to black pen red pen for more practice questions

More advanced: find it yourself if you want to be able to do it, there are lots of resources on the internet. If you want to get a book, get the Kreyszig advanced engineering maths book