

Share Multi Academy Trust

Curriculum Planning Template

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| Subject: | Maths | Year | 13 |  | Pure |

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| Half Term 2 / weeks | Week 1-2 | Week 4-6 |  |  |
| Topic | Unit 15 Algebraic and Partial Fractions  | Unit 16 Functions  | Unit 17 Binomial Theorem  |
| Topic overviewPupils will learn… | To be able to simplify algebraic fractions into one expression and vice versa using partial fraction techniques be able to separate  | To be able to state, define and solve various functions and their inverses.  | To be able to use the binomial expansion for negative and fractional indices.  |
| Components | Students are * To be able to add, subtract, multiply and divide algebraic fractions
* To be able to split a proper fraction into partial fractions
* To be able to recap and use the division of polynomials to break improper fraction fractions into partial
 | Students are * To be able to sketch graphs of functions involving modulus
* To be able to solve equations and inequalities involving modulus
* To be able to state the range and domain of a function
* To understand the definitions of one to one and one to many functions
* To be able to sketch and find inverses of a function
* To be able to apply combinations of the function transformations y = af(x) + b, af(x + b) and f(ax) + b, but will not be required to sketch f(ax + b)
 | Students are * To be able to apply the binomial theorem for negative and fractional indices
* To use partial fractions techniques to split a fraction then apply binomial to get an expansion.
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| What pupils should already know(prior learning components) | Students at this stage should be confident in factorising quadratic expressions and cancelling out common factors. Knowledge of  | Students will have already come across function notation and how the various transformations affect the shape and position of graphs.  | Pupils have already seen the binomial expansion in year 12 but only for positive integers |
| Transferrable knowledge (skills) | Being able to split a fraction in partial fractions is an important skill as it is often the starting point to much bigger problems involving binomial expansions and integration.  | Using the modulus function to sketch and transform graphs can sometimes help pupil gain a greater understanding of the range and domain.  | The techniques learnt in this unit will be used to simplify expressions before integrating in future units  |
| Key vocabulary pupil will know and learn | Polynomial, numerator, denominator, factor, difference of two squares, quadratic, power, index, coefficient, degree, squared, coefficients, improper, identity, algebraic fraction, partial fraction, rational. | Function, mapping, domain, range, modulus, transformation, composite, inverse, one to one, many to one, mappings, f(x), fg(x), f–1x, reflect, translate, stretch. | Binomial, expansion, integer, rational, power, index, coefficient, validity, modulus, factorial, nCr, combinations, , partial fractions, approximation,  |
| Assessment activities | Homework 15 Algebraic and Partial Fractions Test 7 | Homework 16 Functions Test 7  | Homework 17 Binomial expansion Test 7 |
| Resources available | Pearson Pure Mathematics Year 2 Chapter 1Topic Booklets Departmental lesson folderDepartmental resource folder[Physics & Maths Tutor](https://www.physicsandmathstutor.com/)[ExamSolutions](https://www.examsolutions.net/)[www.mathsgenie.co.uk](http://www.mathsgenie.co.uk)[www.mathsnetalevel.com](http://www.mathsnetalevel.com) | Pearson Pure Mathematics Year 2 Chapter 2Topic Booklets Departmental lesson folderDepartmental resource folder[Physics & Maths Tutor](https://www.physicsandmathstutor.com/)[ExamSolutions](https://www.examsolutions.net/)[www.mathsgenie.co.uk](http://www.mathsgenie.co.uk)[www.mathsnetalevel.com](http://www.mathsnetalevel.com) | Pearson Pure Mathematics Year 2 Chapter 4Topic Booklets Departmental lesson folderDepartmental resource folder[Physics & Maths Tutor](https://www.physicsandmathstutor.com/)[ExamSolutions](https://www.examsolutions.net/)[www.mathsgenie.co.uk](http://www.mathsgenie.co.uk)[www.mathsnetalevel.com](http://www.mathsnetalevel.com) |
| NotesWhy this topic is important… | This unit can be seen as a gate way unit to many others. The process of separating an algebraic fraction into partial fractions is used as a starting point to aid in binomial expansion and later to integrate expressions that lead to Ln. The unit begins by recapping the students knowledge of factorising and cancelling common factors, then moves onto separating fractions into partial fractions. The unit ends with fractions that are considered to be top heavy which then brings back algebraic long division from a prior unit to be recapped and built upon.  | This unit begins by recapping the function notation and how they relate to transformations of graphs. Students will then progress to solving equations involving modulus functions leading to a positive and negative solution. The latter half of the unit moves onto inverse and composite functions which students would have touched upon in higher GCSE on a more basic level.  | This unit builds upon the unit in year 12 when binomial expansion was first introduces and explains to the students how to use it for all indices, positive, negative and fractional. The unit begins with recapping earlier techniques and explaining to the pupils that the “choose” button will no longer work with fractional and negative numbers. Hence a new strategy is needed. Binomial expansion has many real-world applications and strong links with probability and statistical analysis which our economy relies heavily upon.  |