Teacher Subject Specialism Training (TSST) – Secondary Maths

ETSA Ealing Teaching School Alliance

FMSP Let maths take you further
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Innovators in Mathematics Education

Twyford C of E Academies Trust

Workshop Schedule (September 2017 – May 2018)

Workshop Title	Content and curriculum reference*	Date
1. Quadratic equations and graph sketching	*Sketching graphs using the three forms of a quadratic equation.* *Sketching higher order graphs.* *Quadratic inequalities.* Algebra - 11 identify and interpret roots, intercepts, turning points of quadratic functions graphically; deduce roots algebraically and turning points by completing the square Algebra - 12 recognise, sketch and interpret graphs of linear functions, quadratic functions simple cubic functions, the reciprocal function y = $\frac{1}{x}$ with x ≠ 0, exponential $y=k^x$ functions for positive values of k. Algebra - 22 solve quadratic inequalities in one variable; represent the solution set on a number line, using set notation and on a graph.	Wednesday 20th Sept 2017
2. Transformation of graphs & function notation	*Function notation including inverse and composite functions.* *Linear transformations of graphs.* Algebra - 7 where appropriate, interpret simple expressions as functions with inputs and outputs; interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'. Algebra - 13 Sketch translations and reflections of a given function.	Thursday 12th October 2017
3. Trigonometric identities	*Developing conceptual understanding of trigonometric ratios in right angled triangles.* *Trigonometry in non-right angled triangles.* Geometry - 20 - 23 know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$, and the trigonometric ratios; apply them to find angles and lengths in right-angled triangles and, where possible, general triangles in two and three dimensional figures. know the exact values of sinθ and cosθ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of tan θ for θ = 0°, 30°, 45° and 60°. know and apply the sine rule and cosine rule to find unknown lengths and angles. know and apply $Area = \frac{1}{2}absinC$ to calculate the area, sides or angles of any triangle.	Thursday 23rd November 2017
4. Non-linear sequences	*Finding the n^{th} term of quadratic and simple geometric sequences.* *Solving problems with sequences in a range of representations.* Algebra – 24 & 25 recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions, Fibonacci type sequences, quadratic sequences, and simple geometric progressions and other sequences. deduce expressions to calculate the n^{th} term of linear and quadratic sequences.	Thursday 14th December 2017

5. Vectors	*Developing conceptual understanding of vectors in 2-D in a variety of contexts.* *Proof with vectors.* Geometry – 24 & 25 describe translations as 2D vectors. apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; use vectors to construct geometric arguments and proofs.	Thursday 18th January 2018
6. Complex Numbers	*Solving equations whose solutions are complex numbers.* *Representing complex numbers on an Argand diagram* Complex Numbers – B1** solve any quadratic equation with real coefficients; solve cubic or quartic equations with real coefficients (given sufficient information to deduce at least one root for cubics or at least one complex root or quadratic factor for quartics) Use and interpret Argand diagrams.	Thursday 22nd February 2018
7. Matrices	*Using matrices to represent linear transformations* Differential Equations – C1** Add, subtract and multiply conformable matrices; multiply a matrix by a scalar. Understand and use zero and identity matrices. Use matrices to represent linear transformations in 2-D. Calculate determinants of 2 X 2 matrices. Calculate and use the inverse of non-singular 2 X 2 matrices.	Thursday 22nd March 2018
8. Consolidation Session – Sine & Cosine functions, Transformation of graphs and Quadratic equations	*Trigonometric graphs.* *Application of transformations to trigonometric and quadratic graphs.* Algebra – 12 & 13	Thursday 10th May 2018

* Curriculum references from GCSE subject content and assessment objectives (DfE).

** Curriculum references from GCE Further Mathematics subject content and assessment objectives (DfE).