

Year 11 Higher Tier Scheme of Learning

Autumn Term

The term begins with an introduction to the various forms of congruence in triangles. This builds on ideas explored the previous year in the unit polygons, angles and parallel lines. An understanding of methods of ruler and compass construction is invaluable here also. Exam questions on this topic typically include a substantial element of proof – a high level skill but one which in this context is relatively straightforward. The natural successor to this topic is that of similarity in two and three dimensions. This also presents the opportunity to interleave concepts of area, volume and ratio.

Similarity is of course the basis of trigonometry; the next area explored by students in Year 11. The unit introduces the extension of the trigonometry of triangles to the circular interpretation so important at A-Level, via a study of the graphs of the basic functions. Transformations to these graphs are also covered here before students move on to study the sine and cosine rules; a further opportunity to explore the nature of proof.

At this point students take a fresh look at data handling; methods of sampling and representations including cumulative frequency and histograms build on topics from the data handling units of year ten. A relatively straightforward topic unlikely to be overly disrupted by the mock exam season.

The final topic of this first term is heavily algebraic, extending the work done in Year 10 on solving and graphing quadratics now to include cubic functions. This is a crucial opportunity to interleave these skills so important to the A-Level student. The equation of a circle is introduced here also, prefiguring the topic to follow.

Spring Term

We begin this term with circle theorems. The topic is rich in opportunities to further explore the structure of mathematical proof, both in exploring the theorems themselves and in applying them to more general problems. This highly geometric topic is supplemented by a return to the algebra of the circle and its attendant lines, building on the geometric insights gained.

We then extend and provide practice of the last few algebraic techniques required at GCSE and not dealt with so far this year. Little here will be entirely new, but a regular return to these ideas is essential. Formal algebraic proofs and the notation associated with general functions are also covered at this point.

Now we introduce an idea, with links to co-ordinate geometry and transformations but taken much further here, namely vectors. The basics of vector algebra are covered along with methods for proving the coincidence of points and collinearity and parallelism of lines. The powerful nature of this branch of maths is demonstrated with a variety of geometric proofs.

The final topic of 'new' material follows; graphs of reciprocal and exponential functions. This allows a graphical treatment of problems involving repeated percentage change, covered at the end of Year 10. We move on to problems involving inverse proportion - first covered in Year 10 – with an opportunity to extend and formalise these ideas further.

Summer Term

We aim for the Scheme of Learning to be complete by the end of the spring term so our focus can turn to exam preparation and revision of key topics. Topics are identified on a class by class basis and through thorough analysis of previous assessments, (such as mocks) to identify strengths and weaknesses of individuals and also of the class as a whole. Model answers to past exam questions are developed and used to emphasise good exam technique, and opportunities to implement examiner mark schemes are incorporated. Students will be encouraged to work under a degree of time pressure and scrutiny to develop the necessary focus under pressure. Walking/talking mocks will be offered to further hone exam technique. Maths Genie and Hegarty Maths, as well as a variety of free online resources and revision guides are available to facilitate individual revision. Time will be put aside to allow students themselves to suggest topics for further revision based on their self-analysis and individual efforts.