**LANGDON PARK SIXTH FORM**

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| **Subject: Mathematics** | **Year: Y12** | **Topic 4: Functions**  |

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| ***What and Why*:** Functions are an extremely important mathematical idea that will be applied throughout your mathematical career. In this unit, you will build upon your knowledge of quadratic graphs, learn about the transformation of graphs and the formal definition of functions. You will also learn in detail about modulus & trigonometric functions, as well as an entirely new method of defining functions. |

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| **Key terms****Quadratics*** Work with quadratic functions and their graphs;
* The discriminant of a quadratic function, including the conditions for real and repeated roots
* Completing the square
* Solution of quadratic equations including solving quadratic equations in a function of the unknown
* Solve quadratic inequalities
 | **Transformations*** Understand the effect of simple transformations on the graph of y = f(x) including sketching associated graphs: y = af(x) , y = f (x) + a, y = f (x + a) , y = f(ax) , and combinations of these transformations**.**
* Understand the order of these transformations when there is a combination of more than one transformation.
 | **Functions*** Understand and use the definition of a function; domain and range of functions.
* Understand and use composite functions.
* Find inverse functions and their graphs.
* Use flow diagrams to find an inverse.
* Understand geometrically what a reflection is and in the line y=x.
* Understand how the domain and range of a function and its inverse are connected.
 | **Modulus functions*** Use modulus notation $\left|x\right|$
* Be able to define what is meant by a modulus function.
* Know what the difference between $\left|f(x)\right|$ and $f(\left|x\right|)$.
* Be able to sketch a modulus function.
* Be able to solve equations with modulus functions.

Be able to solve inequalities with modulus functions.**Parametric Functions*** Define a parametric function.
* Understand and use the parametric equations of curves and conversion between Cartesian and parametric forms.
* Use parametric equations in modelling in a variety of contexts.

  | **Trigonometric Functions** * Know and sketch the graphs of sin(x), cos(x) and tan(x) and their inverses.
* State the range and domain of all these functions.
* Use trigonometric functions to solve problems in context.
* Construct proofs involving trigonometric functions and identities.
* Solve trigonometric equations.
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| **Specification point** | **Pre-reading** | **Application and Assessment (date)** | **Independent learning** | **Extension – Cultural Capital and Reading** |
| B3, B7, B8, B9, B11, C3, C4, E1, E3, E4, E5, E8,  | **Topics you should be confident in prior to unit:** * Linear and quadratic functions, Quadratic formula
* Transformations and vector notation, Sketching graphs
* Modulus notation from binomial unit.
* GCSE Trigonometry including graphs of trigonometric functions.

**Websites**[**http://www.a-levelmathstutor.com/functions.php**](http://www.a-levelmathstutor.com/functions.php) | * End of unit assessment
* 50% seen
* 50% unseen
* 90% pass needed or resit required.
 | Kerboodle Online LoginMy MathsExam SolutionsMaths Genie  | **Online Mathematical articles and content can be found here:** <https://nrich.maths.org/5748> - women in mathematics<https://nrich.maths.org/6843> - the history of trigonometry. |

**Pre-assessment content review**

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| I feel secure in | I need to focus on | My action plan |

**Pre-assessment skills review**

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| I feel secure in | I need to focus on | My action plan |

**Post-assessment review**

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| Weaknesses in content knowledge | Skills I need to focus on | My action plan |
| Retest / review – teacher and student comment |

**Revision planning**

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| Spec point | Notes complete | Revision materials | Past paper Qs  | Timed conditions |
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