

UTC Maths Department Learning Cycles 2019 – Year 11 Higher

Cycle 2.6	Cycle 2.7	Cycle 2.8	Cycle 2.9	Cycle 2.10
<p align="center">Topics</p> <ul style="list-style-type: none"> ● Binomial Theorem <ul style="list-style-type: none"> ○ Where n is negative ○ Where n is a fraction ● Trigonometry & Circular Measure <ul style="list-style-type: none"> ○ Radian Measures ○ Arc Length / Area of Sector ○ Small angle approximations ○ Secant / cosecant / cotangent ○ Use $\sec^2\theta = 1+\tan^2\theta$ ○ Use $\operatorname{cosec}^2\theta = 1+\cot^2\theta$ ● Functions & Transformations <ul style="list-style-type: none"> ○ Simplify rational expressions ○ The modulus of linear functions ○ Composite & Inverse functions ○ Transformations ● Equilibrium & Resolving forces <ul style="list-style-type: none"> ○ Vectors in 3D ○ Vectors in Kinematics ○ Using trig to resolve forces ○ Acceleration in 2D 	<p align="center">Topics</p> <ul style="list-style-type: none"> ● Trigonometry <ul style="list-style-type: none"> ○ Double angle formula ○ Trig proofs ● Further Differentiation <ul style="list-style-type: none"> ○ Trig derivatives ○ e^x and $\ln x$ derivatives ○ Find points of inflection ○ The Product Rule ○ The Quotient Rule ○ The Chain Rule ● Further Integration <ul style="list-style-type: none"> ○ Trig & log integrals ○ Area between curves ○ Limit of a sum ○ Integrate by substitution or parts. ● Statics & Dynamics <ul style="list-style-type: none"> ○ Applying calculus ○ Modelling motion under gravity. ○ Newton's 2nd Law ○ Coplanar forces ○ Resultant Forces ○ Dynamics of motion in a plane. ○ Coefficient of Friction 	<p align="center">Topics</p> <ul style="list-style-type: none"> ● Parametric Equations <ul style="list-style-type: none"> ○ Convert between Cartesian and parametric form. ○ Model parametrics ○ Differentiate parametrics ● Numerical Methods <ul style="list-style-type: none"> ○ Locate roots of $f(x)=0$ ○ Change of sign ○ Iterative methods ○ Newton-Raphson ○ Numerical Integration ● Partial Fractions & Integration <ul style="list-style-type: none"> ○ Decompose rational functions into partial fractions. ○ Integrate using partial fractions ● Moments <ul style="list-style-type: none"> ○ Use derived quantities & units ○ Use moments in simple static contexts 	<p align="center">Topics</p> <ul style="list-style-type: none"> ● Further Probability <ul style="list-style-type: none"> ○ Conditional Probability ○ Modelling with probability ● Statistical Distribution <ul style="list-style-type: none"> ○ Normal Distribution ○ Link to Histograms ○ Use of Binomial or Normal Distribution. ● Differential Equations <ul style="list-style-type: none"> ○ Modelling functions ○ Differentiate functions & relations ○ Construct differential equations ○ Interpret and evaluate differential equations. ● Revision of Mechanics & Calculus 	<p align="center">Topics</p> <ul style="list-style-type: none"> ● Statistical Hypothesis Testing <ul style="list-style-type: none"> ○ Apply correlation coefficients ○ Statistical Hypothesis testing ● Revision of Pure ● Revision of Calculus ● Past Paper Revision
<p align="center">Keywords</p>	<p align="center">Keywords</p>	<p align="center">Keywords</p>	<p align="center">Keywords</p>	<p align="center">Keywords</p>
<p align="center">Topic Assessments Used</p>	<p align="center">Topic Assessments Used</p>	<p align="center">Topic Assessments Used</p>	<p align="center">Topic Assessments Used</p>	<p align="center">Topic Assessments Used</p>