

	Year 13 Mathematics – Statistics and Mechanics					Bespoke Revision based on Mock QLA	
	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1		S Term 2
BIG Q Content Statistics	Can we assign a numerical value to a set of data's correlation? - Understand about exponential models and their link to linear relationships - To find out a numerical value between -1 and 1 to understand a data's correlation	What will the probability of an event be, if another event has already occurred? - Understand Set notation - Understand Conditional Probability - Use the year 12 content of sample spaces, Venn and tree diagrams to solve conditional probability - Use probability formulae	Can we use another type of distribution if the parameters change? - Understand the normal distribution and the characteristics of it - Understand the key percentage points of the normal distribution	Can we use the normal distribution if we are missing key data? - Use the inverse normal distribution function to work backwards from the percentage value - Understand the 'standard' normal distribution and how it can be used to find unknown values of μ or σ	Is there a link between the 2 types of distributions (binomial and normal)? - Understand how to approximate a binomial distribution from a normal distribution and why you would do this. - To apply hypothesis testing to normal distributions		
Mechanics	Can we simulate real-life problems more accurately by including friction? - Understand that when a force is applied at angle, you can resolve it horizontally and vertically - Understand friction, and calculate the new forces acting upon an object - Understand the coefficient of friction	Can we predict scenarios when an object is projected horizontally? - To be able to model motion under gravity horizontally - To solve problems when a particle is projected at an angle - Derive and understand the formulae to time, range of greatest height of a projectile.	Can we understand more on the forces acting on a static particle? - Find unknown forces on a static particle - Solve problems on a static particle involving weight, tension and pulley systems, with and without friction - Understand and solve limiting equilibrium problems	Can we understand more on the forces acting on a dynamic particle? - Understand how forces and friction work on a particle moving along a rough plane - With all this new information, apply this to connected particles from year 12 in greater detail	Can we predict even more scenarios when the acceleration is changing? - Understand vectors in the context of mechanics - To differentiate and integrate models as a function of time to find missing displacement, velocity or acceleration - Apply the above to vectors in context		
Vocabulary; Key words for each half term	1. Exponential 2. Product Moment Correlation Coefficient 3. Hypothesis 4. Resolve 5. Friction 6. Coefficient (of friction)	1. Union 2. Intersection 3. Complement 4. Conditional 5. Projectile 6. Components 7. Trajectory	1. Continuous distribution 2. Bell curve 3. Symmetrical 4. Points of inflection 5. Static 6. Tension 7. Limiting Equilibrium 8. Resultant	1. Inverse 2. Standardise 3. Particle 4. Connected 5. Equilibrium	1. Continuity correction 2. Sample mean 3. Position Vector 4. Variable 5. Vectors 6. Projectiles 7. Initial		
Catholic Link	- René Descartes was a devout Catholic philosopher and mathematician, and the Cartesian coordinate system, was named directly after him - Pierre de Fermat was a lay Catholic who worked closely with religious orders, when you differentiate a function and set $f'(x) = 0$ to find a stationary point, you are utilizing Fermat's direct contribution to early calculus. - The concepts of an infinite series and limits was advanced by Jesuit priests like Gregory St. Vincent and André Tacquet, who used geometric series to solve problems of area, effectively laying the groundwork for integration						
Careers Link	Actuarial Analyst, Data Scientist, Astronomer/Astrophysicist, Forensic Accountant, Operations Research Analyst						
Ways to enrich the year 13 curriculum at home. - Find the perfect temperature for a cup of tea! From Newton's Laws of cooling, it will follow this specific exponential model; $T(t) = T_s + (T_0 - T_s)e^{-kt}$. $T(t)$ = Temperature at time, T_s = room temperature T_0 = Initial temperature of the drink at $t = 0$, k = The cooling constant (dependent on the mug, so we need to find this!) - Measure the temperature in the room T_s, then the temperature as you make the cup of tea T_0. After 3 minutes, measure the Temperature again. Use these 3 values in the model above, and rearrange to find k. - Now, apparently the perfect temperature is 60°C, so now you know k, sub this for $T(t)$, and use your T_s and T_0 values to rearrange for t, and that's when you should drink your cup of tea!							