

Year: 12

Subject: A-level Maths

Spring Term			
What has come before and what comes later:	GCSE Maths		
	Pure	Statistics	Mechanics
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	<ul style="list-style-type: none"> Do you know how to create Pascal's triangle? Do you understand factorial notation? Can you use the binomial expansion? Can you use the binomial expansion to calculate estimations? Are you able to use the Cosine rule to find a missing side or angle? Can you use the Sine rule to find a missing side or angle? Can you find the area of a triangle using an appropriate formula? Can you solve problems involving triangles? Can you sketch the graphs of sine, cosine and tangent functions? Can you sketch simple transformations of these graphs? Can you calculate the sine, cosine and tangent of any angle? Do you know the exact trigonometric ratios for 30, 45 and 60 degrees? Do you know the relationships $\tan\theta = \sin\theta/\cos\theta$ and $\sin^2\theta + \cos^2\theta = 1$ Can you solve simple trigonometric equations of the form $\sin\theta = k$, $\cos\theta = k$ and $\tan\theta = k$? Can you solve more complicated trigonometry equations of the form $\sin n\theta = k$ and $\sin(\theta \pm \alpha) = k$ and equivalent equations involving cos and tan? Are you able to solve trigonometry equations that produce quadratics? 	<ul style="list-style-type: none"> Can you identify outliers? Can you draw and interpret box plots? Can you draw and interpret cumulative frequency diagrams? Can you draw and interpret histograms? Are you able to draw and interpret scatter diagrams? Are you able to distinguish between interpolation and extrapolation? Are you able to interpret the coefficients of a regression line? Are you able to calculate simple probabilities? Can you draw and interpret venn diagrams Can you understand the concepts of events being mutually exclusive and independent? Can you use tree diagram? 	<ul style="list-style-type: none"> Can you draw force diagrams and calculate resultant forces? Do you understand Newtons first law? Can you calculate resultant forces by adding vectors? Do you understand and an you use Newtons second law? Can you apply Newtons second law to forces and acceleration? Do you understand Newtons third law? Can you solve problems involving connected particles?

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	<ul style="list-style-type: none"> • Can you use vectors in two dimensions? • Can you use column vectors and carry out arithmetic operations on vectors? • Are you able to calculate the magnitude and direction of a vector? • Do you understand and can you use position vectors? • Can you use vectors to solve geometric problems? • Do you understand vector magnitude and can you use vectors in speed and distance calculations? • Can you use vectors to solve problems in context? • Can you find the derivative, $f'(x)$ of a simple function? • Can you use the derivative to solve problems involving gradients, tangents and normal? • Are you able to identify increasing and decreasing functions? • Can you find the second order derivative $f''(x)$ of a simple function? • Are you able to find stationary points of functions and determine their nature? • Can you sketch the graph of a given function? • Can you model real-life situations with differentiation? 		
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