

Chapter	Subtopic	Learning objectives	Mixed Exercise Questions and Exam Questions	Recommended IM quizzes
Y1P1 Algebraic expressions Pre-req: GCSE	1.1 Index laws 1.2 Expanding brackets 1.3 Factorising 1.4 Negative and fractional indices 1.5 Surds 1.6 Rationalising denominators	Multiply and divide integer powers Expand a single term over brackets and collect like terms Expand the product of two or three expressions Factorise linear, quadratic and simple cubic expressions Know and use the laws of indices Simplify and use the rules of surds Rationalise denominators	4□ 6□ 7□ 8□ 13□ 15□ 21□ 23□ 24□ Y1P1 XMQs and MS.pdf	Y1P1 S1 (Surds) Y1P1 S2 (Indices)
Y1P2 Quadratics Pre-req: GCSE	2.1 Solving quadratic equations 2.2 Completing the square 2.3 Functions 2.4 Quadratic graphs 2.5 The discriminant 2.6 Modelling with quadratic	Solve quadratic equations using factorisation, the quadratic formula and completing the square Read and use $f(x)$ notation when working with functions Sketch the graph and find the turning point of a quadratic function Find and interpret the discriminant of a quadratic expression Use and apply models that involve quadratic functions	2□ 5□ 8□ 11□ 12□ 14□ Y1P2 XMQs and MS.pdf	Y1P2 Q1 (Quadratic graphs and equations) Y1P2 Q2 (Quadratic formula)
Y1P3 Equations and inequalities Pre-req: Y1P1, Y1P2	3.1 Linear simultaneous equations 3.2 Quadratic simultaneous equations 3.3 Simultaneous equations on graphs 3.4 Linear inequalities 3.5 Quadratic inequalities 3.6 Inequalities on graphs 3.7 Regions	Solve linear simultaneous equations using elimination or substitution Solve simultaneous equations: one linear and one quadratic Interpret algebraic solutions of equations graphically Solve linear inequalities Solve quadratic inequalities Interpret inequalities graphically Represent linear and quadratic inequalities graphically	1□ 4□ 5□ 7□ Y1P3 XMQs and MS.pdf	Y1P3 E1 (Simultaneous equations) Y1P3 E2 (Inequalities)
Y1P4 Graphs and transformations Pre-req: Y1P3	4.1 Cubic graphs 4.2 Quartic graphs 4.3 Reciprocal graphs 4.4 Points of intersection 4.5 Translating graphs 4.6 Sketching graphs 4.7 Transforming functions	Sketch cubic graphs Sketch quartic graphs Sketch reciprocal graphs of the form $y = a/x$ and $y = a/x^2$ Use intersection points of graphs to solve equations Translate graphs Stretch graphs Transform graphs of unfamiliar functions	3□ 5□ 7□ 10□ 13□ Y1P4 XMQs and MS.pdf	Y1P4 P1 (Polynomial functions and graphs) Y1P4 G1 (Sketching graphs) Y1P4 G2 (Transformations of graphs)
Y1P5 Straight line graphs Pre-req: Y1P1	5.1 $y=mx+c$ 5.2 Equations of straight lines 5.3 Parallel and perpendicular lines 5.4 Length and area 5.5 Modelling with straight lines	Calculate the gradient of a line joining a pair of points Understand the link between the equation of a line, and its gradient and intercept Find the equation of a line given (i) the gradient and one point on the line or (ii) two points on the line Find the point of intersection for a pair of straight lines Know and use the rules for parallel and perpendicular gradients Solve length and area problems on coordinate grids Use straight line graphs to construct mathematical models	2□ 6□ 8□ 10□ 15□ 16□ 18□ Y1P5 XMQs and MS.pdf	Y1P5 C1 (Points and straight lines)
Y1P6 Circles Pre-req: Y1P2, Y1P5	6.1 Midpoints and perpendicular bisectors 6.2 Equation of a circle 6.3 Intersections of straight lines and circles 6.4 Use tangent and chord properties 6.5 Circles and triangles	Find the midpoint of a line segment Find the equation of the perpendicular bisector to a line segment Know how to find the equation of a circle Solve geometric problems involving straight lines and circles Use circle properties to solve problems on coordinate grids Find the angle in a semicircle and solve other problems involving circles and triangles	3□ 12□ 15□ 16□ 18□ 22□ Y1P6 XMQs and MS.pdf	Y1P6 C2 (Circles)
Y1P7 Algebraic methods Pre-req: Y1P1, Y1P2	7.1 Algebraic fractions 7.2 Dividing polynomials 7.3 The factor theorem 7.4 Mathematical proof 7.5 Methods of proof	Cancel factors in algebraic fractions Divide a polynomial by a linear expression Use the factor theorem to factorise a cubic expression Construct mathematical proofs using algebra Use proof by exhaustion and disproof by counter-example	3□ 5□ 9□ 14□ 16□ 18□ 22□ 24□ Y1P7 XMQs and MS.pdf	Y1P7 PS2 (Notation and proof) Y1P7 P2 (Dividing and factorising polynomials)
Y1P8 The binomial expansion Pre-req: Y1P1	8.1 Pascal's triangle 8.2 Factorial notation 8.3 The binomial expansion 8.4 Solving binomial problems 8.5 Binomial estimation	Use Pascal's triangle to identify binomial coefficients and use them to expand simple binomial expressions Use combinations and factorial notation Use the binomial expansion to expand brackets Find individual coefficients in a binomial expansion Make approximations using the binomial expansion	4□ 6□ 9□ 12□ 15□ 20□ 21□ Y1P8 XMQs and MS.pdf	Y1P8 B1 (Binomial expansion)
Y1P9 Trigonometric ratios Pre-req: Y1P4	9.1 The cosine rule 9.2 The sine rule 9.3 Areas of triangles 9.4 Solving triangle problems 9.5 Graphs of sine, cosine and tangent 9.6 Transforming trigonometric graphs	Use the cosine rule to find a missing side or angle Use the sine rule to find a missing side or angle Find the area of a triangle using an appropriate formula Solve problems involving triangles Sketch the graphs of the sine, cosine and tangent functions Sketch simple transformations of these graphs	4□ 6□ 8□ 9□ 13□ 18□ Y1P9 XMQs and MS.pdf	Y1P9 T1 (Trig functions and identities) Y1P9 T3 (Sine and cosine rules)
Y1P10 Trigonometric identities and equations Pre-req: Y1P9	10.1 Angles in all four quadrants 10.2 Exact values of trigonometrical ratios 10.3 Trigonometric identities 10.4 Simple trigonometric equations 10.5 Harder trigonometric equations 10.6 Equations and identities	Calculate the sine, cosine and tangent of any angle Know the exact trigonometric ratios for 30° , 45° and 60° Know and use the relationships $\tan\theta = \sin\theta / \cos\theta$ and $\sin^2\theta + \cos^2\theta = 1$ Solve simple trigonometric equations of the forms $\sin\theta = k$, $\cos\theta = k$ and $\tan\theta = k$ Solve more complicated trigonometric equations of the forms $\sin(n\theta) = k$ and $\sin(\theta + a) = k$ and equivalent equations involving \cos and \tan Solve trigonometric equations that produce quadratics	4□ 5□ 7□ 11□ 12□ 14□ 18□ 20□ Y1P10 XMQs and MS.pdf	Y1P10 T1 (Trig functions and identities) Y1P10 T2 (Trig equations)
Y1P11 Vectors Pre-req: Y1P9	11.1 Vectors 11.2 Representing vectors 11.3 Magnitude and direction 11.4 Position vectors 11.5 Solving geometric problems 11.6 Modelling with vectors	Use vectors in two dimensions Use column vectors and carry out arithmetic operations on vectors Calculate the magnitude and direction of a vector Understand and use position vectors Use vectors to solve geometric problems Understand vector magnitude and use vectors in speed and distance calculations Use vectors to solve problems in context	2□ 4□ 8□ 11□ 12□ 13□ Y1P11 XMQs and MS.pdf	Y1P11 V1 (Vectors intro)
Y1P12 Differentiation Pre-req: Y1P5	12.1 Gradients of curves 12.2 Finding the derivative 12.3 Differentiating x^n 12.4 Differentiating quadratics 12.5 Differentiating functions with two or more terms 12.6 Gradients, tangents and normals 12.7 Increasing and decreasing functions 12.8 Second order derivatives 12.9 Stationary points 12.10 Sketching gradient functions 12.11 Modelling with differentiation	Find the derivative, $f'(x)$ or dy/dx of a simple function Use the derivative to solve problems involving gradients, tangents and normals Identify increasing and decreasing functions Find the second order derivative, $f''(x)$ or d^2y/dx^2 of a simple function Find stationary points of functions and determine their nature Sketch the gradient function of a given function Model real-life situations with differentiation	1□ 3□ 5□ 8□ 10□ 14□ 18□ 20□ 25□ 29□ Y1P12 XMQs and MS.pdf	Y1P12 D1 (Differentiation intro) Y1P12 D2 (Max and min points) Y1P12 D3 (Differentiating all powers) Y1P12 D4 (Second derivative)
Y1P13 Integration Pre-req: Y1P4, Y1P12	13.1 Integrating x^n 13.2 Indefinite integrals 13.3 Finding functions 13.4 Definite integrals 13.5 Areas under curves 13.6 Areas under the x-axis 13.7 Areas between curves and lines	Find y given dy/dx for x^n Integrate polynomials Find $f(x)$, given $f'(x)$ and a point on the curve Evaluate a definite integral Find the area bounded by a curve and the x-axis Find areas bounded by curves and straight lines	4□ 5□ 7□ 8□ 10□ 11□ 13□ 17□ 20□ 24□ Y1P13 XMQs and MS.pdf	Y1P13 I1 (Integration intro)
Y1P14 Exponentials and logarithms Pre-req: Y1P1, Y1P2, Y1P3, Y1P4	14.1 Exponential functions 14.2 $y=e^x$ 14.3 Exponential modelling 14.4 Logarithms 14.5 Laws of logarithms 14.6 Solving equations using logarithms 14.7 Working with natural logarithms 14.8 Logarithms and non-linear data	Sketch graphs of the form $y = a^x$, $y = e^x$, and transformations of these graphs Differentiate e^x and understand why this result is important Use and interpret models that use exponential functions Recognise the relationship between exponents and logarithms Recall and apply the laws of logarithms Solve equations of the form $a^x = b$ Describe and use the natural logarithm function Use logarithms to estimate the values of constants in non-linear models	1□ 2□ 6□ 7□ 8□ 9□ 11□ 12□ 14□ 16□ Y1P14 XMQs and MS.pdf	Y1P14 L1 (Exponentials and logs) Y1P14 L2 (Natural log) Y1P14 L3 (Exponential modelling)

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Y1S1 Data collection Pre-req: GCSE	1.1 Populations and samples 1.2 Sampling 1.3 Non-random sampling 1.4 Types of data 1.5 The large data set	Understand 'population', 'sample' and 'census', and comment on the advantages and disadvantages of each Understand the advantages and disadvantages of simple random sampling, systematic sampling, stratified sampling, quota sampling and opportunity sampling Define qualitative, quantitative, discrete and continuous data, and understand grouped data Understand the large data set and how to collect data from it, identify types of data and calculate simple statistics	3□ 5□ 8□ Y1S1 XMQs and MS.pdf	Y1S1 D1 (Collecting data)
Y1S2 Measures of location and spread Pre-req: Y1S1	2.1 Measures of central tendency 2.2 Other measures of location 2.3 Measures of spread 2.4 Variance and standard deviation 2.5 Coding	Calculate measures of central tendency such as the mean, median and mode Calculate measures of location such as percentiles and deciles Calculate measures of spread such as range, interquartile range and interpercentile range Calculate variance and standard deviation Understand and use coding	4□ 6□ 8□ 12□ Y1S2 XMQs and MS.pdf	Y1S2 D2 (Representing data)
Y1S3 Representations of data Pre-req: Y1S2	3.1 Outliers 3.2 Box plots 3.3 Cumulative frequency 3.4 Histograms 3.5 Comparing data	Identify outliers in data sets Draw and interpret box plots Draw and interpret cumulative frequency diagrams Draw and interpret histograms Compare two data sets	2□ 3□ 5□ 8□ Y1S3 XMQs and MS.pdf	Y1S3 D2 (Representing data)
Y1S4 Correlation Pre-req: GCSE	4.1 Correlation 4.2 Linear regression	Draw and interpret scatter diagrams for bivariate data - Interpret correlation and understand that it does not imply causation Interpret the coefficients of a regression line equation for bivariate data Understand when you can use a regression line to make predictions	3□ 5□ 6□ Y1S4 XMQs and MS.pdf	Y1S4 D3 (Bivariate data)
Y1S5 Probability Pre-req: GCSE	5.1 Calculating probabilities 5.2 Venn diagrams 5.3 Mutually exclusive and independent events 5.4 Tree diagrams	Calculate probabilities for single events Draw and interpret Venn diagrams Understand mutually exclusive and independent events, and determine whether two events are independent Use and understand tree diagrams	3□ 5□ 6□ 9□ 10□ Y1S5 XMQs and MS.pdf	Y1S5 P1 (Probability intro)
Y1S6 Statistical distributions Pre-req: Y1S5	6.1 Probability distributions 6.2 The binomial distribution 6.3 Cumulative probabilities	Understand and use simple discrete probability distributions including the discrete uniform distribution Understand the binomial distribution as a model and comment on appropriateness Calculate individual probabilities for the binomial distribution Calculate cumulative probabilities for the binomial distribution	2□ 5□ 7□ 10□ 14□ Y1S6 XMQs and MS.pdf	Y1S6 B1 (Binomial distribution)
Y1S7 Hypothesis testing Pre-req: Y1S1, Y1S6	7.1 Hypothesis testing 7.2 Finding critical values 7.3 One-tailed tests 7.4 Two-tailed tests	Understand the language and concept of hypothesis testing Understand that a sample is used to make an inference about a population Find critical values of a binomial distribution using tables Carry out a one-tailed test for the proportion of the binomial distribution and interpret the results Carry out a two-tailed test for the proportion of the binomial distribution and interpret the results	3□ 6□ 7□ 8□ 10□ Y1S7 XMQs and MS.pdf	Y1S7 H1 (Hypothesis testing intro) Y1S7 H2 (More hypothesis testing)
Y1M8 Modelling in mechanics Pre-req: GCSE	8.1 Constructing a model 8.2 Modelling assumptions 8.3 Quantities and units 8.4 Working with vectors	Understand how the concept of a mathematical model applies to mechanics Understand and be able to apply some of the common assumptions used in mechanical models Know SI units for quantities and derived quantities used in mechanics Know the difference between scalar and vector quantities	2□ 5□ 7□ 9□	
Y1M9 Constant acceleration Pre-req: GCSE	9.1 Displacement-time graphs 9.2 Velocity-time graphs 9.3 Constant acceleration formulae 1 9.4 Constant acceleration formulae 2 9.5 Vertical motion under gravity	Understand and interpret displacement-time graphs Understand and interpret velocity-time graphs Derive the constant acceleration formulae and use them to solve problems Use the constant acceleration formulae to solve problems involving vertical motion under gravity	2□ 4□ 8□ 11□ 13□ 17□ Y1M9 XMQs and MS.pdf	Y1M9 K1 (Displacement and distance) Y1M9 K2 (Velocity and acceleration) Y1M9 K3 (SUVAT equations)
Y1M10 Forces and motion Pre-req: Y1M8, Y1M9	10.1 Force diagrams 10.2 Forces as vectors 10.3 Forces and acceleration 10.4 Motion in 2 dimensions 10.5 Connected particles 10.6 Pulleys	Draw force diagrams and calculate resultant forces Understand and use Newton's first law Calculate resultant forces by adding vectors Understand and use Newton's second law, $F = ma$ Apply Newton's second law to vector forces and acceleration Understand and use Newton's third law Solve problems involving connected particles	4□ 6□ 11□ 12□ 14□ Y1M10 XMQs and MS.pdf	Y1M10 F2 (Newton's second law) Y1M10 F3 (Connected objects)
Y1M11 Variable acceleration Pre-req: Y1P13	11.1 Functions of times 11.2 Using differentiation 11.3 Maxima and minima problems 11.4 Using integration 11.5 Constant acceleration formulae	Understand that displacement, velocity and acceleration may be given as functions of time Use differentiation to solve kinematics problems Use calculus to solve problems involving maxima and minima Use integration to solve kinematics problems Use calculus to derive constant acceleration formulae	2□ 5□ 8□ 11□ 13□ Y1M11 XMQs and MS.pdf	Y1M11 V1 (Variable acceleration)

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Y2P1 Algebraic methods Pre-req: Y1P7	1.1 Proof by contradiction 1.2 Algebraic fractions 1.3 Partial fractions 1.4 Repeated factors 1.5 Algebraic division	Use proof by contradiction to prove true statements Multiply and divide two or more algebraic fractions Add or subtract two or more algebraic fractions Convert an expression with linear factors in the denominator into partial fractions Convert an expression with repeated linear factors in the denominator into partial fractions Divide algebraic expressions Convert an improper fraction into partial fraction form	1□ 2□ 4□ 7□ 9□ 16□ Y2P1_XMQs_and_MS.pdf	Y2P1 P1 (Methods of proof) Y2P1 A2 (Rational expressions) Y2P1 A3 (Partial fractions)
Y2P2 Functions and graphs Pre-req: Y1P4	2.1 The modulus function 2.2 Functions and mappings 2.3 Composite functions 2.4 Inverse functions 2.5 $y = \text{mod}(f(x))$ and $y = f(\text{mod}(x))$ 2.6 Combining transformations 2.7 Solving modulus problems	Understand and use the modulus function Understand mappings and functions, and use domain and range Combine two or more functions to make a composite function Know how to find the inverse of a function graphically and algebraically Sketch the graphs of the modulus functions $y = f(x) $ and $y = f(x)$ Apply a combination of two (or more) transformations to the same curve Transform the modulus function	2□ 4□ 7□ 8□ 11□ 21□ Y2P2_XMQs_and_MS.pdf	Y2P2 F1 (Functions, graphs and transformations) Y2P2 F2 (Composite and inverse functions) Y2P2 F3 (Modulus function)
Y2P3 Sequences and series Pre-req: Y1P14	3.1 Arithmetic sequences 3.2 Arithmetic series 3.3 Geometric sequences 3.4 Geometric series 3.5 Sum to infinity 3.6 Sigma notation 3.7 Recurrence relations 3.8 Modelling with series	Find the n th term of an arithmetic sequence Prove and use the formula for the sum of the first n terms of an arithmetic series Find the n th term of a geometric sequence Prove and use the formula for the sum of a finite geometric series Prove and use the formula for the sum to infinity of a convergent geometric series Use sigma notation to describe series Generate sequences from recurrence relations Model real-life situations with sequences and series	2□ 3□ 7□ 9□ 12□ 14□ 16□ 17□ Y2P3_XMQs_and_MS.pdf	Y2P3 S1 (Sequences) Y2P3 S2 (Arithmetic sequences) Y2P3 S3 (Geometric sequences)
Y2P4 Binomial expansion Pre-req: Y1P1, Y2P8	4.1 Expanding $(1+x)^n$ 4.2 Expanding $(a+bx)^n$ 4.3 Using partial fractions	Expand $(1+x)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid Expand $(a+bx)^n$ for any rational constant n and determine the range of values of x for which the expansion is valid Use partial fractions to expand fractional expressions	4□ 9□ 13□ 15□ Y2P4_XMQs_and_MS.pdf	Y2P4 A1 (General binomial)
Y2P5 Radians Pre-req: Y1P10	5.1 Radian measure 5.2 Arc length 5.3 Areas of sectors and segments 5.4 Solving trigonometric equations 5.5 Small angle approximations	Convert between degrees and radians and apply this to trigonometric graphs and their transformations Know exact values of angles measured in radians Find an arc length using radians Find areas of sectors and segments using radians Solve trigonometric equations in radians Use approximate trigonometric values when θ is small	2□ 4□ 7□ 14□ 17□ 25□ 27□ Y2P5_XMQs_and_MS.pdf	Y2P5 T1 (Radians intro) Y2P5 T2 (Small angles)
Y2P6 Trigonometric functions Pre-req: Y2P5	6.1 Secant, cosecant and cotangent 6.2 Graphs of $\sec(x)$, $\text{cosec}(x)$ and $\cot(x)$ 6.3 Using $\sec(x)$, $\text{cosec}(x)$ and $\cot(x)$ 6.4 Trigonometric identities 6.5 Inverse trigonometric functions	Understand the definitions of secant, cosecant and cotangent and their relationship to cosine, sine and tangent Understand the graphs of secant, cosecant and cotangent and their domain and range Simplify expressions, prove simple identities and solve equations involving secant, cosecant and cotangent Prove and use $\sec^2 x = 1 + \tan^2 x$ and $\text{cosec}^2 x = 1 + \cot^2 x$ Understand and use inverse trigonometric functions and their domain and ranges	4□ 6□ 17□ 20□ 22□ Y2P6_XMQs_and_MS.pdf	Y2P6 TF1 (Reciprocal and inverse trig)
Y2P7 Trigonometry and modelling Pre-req: Y2P6	7.1 Addition formulae 7.2 Using the angle addition formulae 7.3 Double-angle formulae 7.4 Solving trigonometric equations 7.5 Simplifying $\text{acos}(x) \pm \text{bsin}(x)$ 7.6 Proving trigonometric identities 7.7 Modelling with trigonometric functions	Prove and use the addition formulae Understand and use the double-angle formulae Solve trigonometric equations using the double-angle and addition formulae Write expressions of the form $\text{acos}\theta + \text{bsin}\theta$ in the forms $R\cos(\theta \pm \alpha)$ or $R\sin(\theta \pm \alpha)$ Prove trigonometric identities using a variety of identities Use trigonometric functions to model real-life situations	6□ 9□ 14□ 17□ 21□ 27□ Y2P7_XMQs_and_MS.pdf	Y2P7 T11 (Compound angles) Y2P7 T12 (R cos x-a)
Y2P8 Parametric equations Pre-req: Y1P6, Y1P14, Y2P7	8.1 Parametric equations 8.2 Using trigonometric identities 8.3 Curve sketching 8.4 Points of intersection 8.5 Modelling with parametric equations	Convert parametric equations into Cartesian form by substitution Convert parametric equations into Cartesian form using trigonometric identities Understand and use parametric equations of curves and sketch parametric curves Solve coordinate geometry problems involving parametric equations Use parametric equations in modelling in a variety of contexts	1□ 5□ 8□ 10□ 13□ 17□ Y2P8_XMQs_and_MS.pdf	Y2P8 PE1 (Parametric curves)
Y2P9 Differentiation Pre-req: Y1P12, Y2P8	9.1 Differentiating $\sin(x)$ and $\cos(x)$ 9.2 Differentiating exponentials and logarithms 9.3 The chain rule 9.4 The product rule 9.5 The quotient rule 9.6 Differentiating trigonometric functions 9.7 Parametric differentiation 9.8 Implicit differentiation 9.9 Using second derivatives 9.10 Rates of change	Differentiate trigonometric functions Differentiate exponentials and logarithms Differentiate functions using the chain, product and quotient rules Differentiate parametric equations Differentiate functions which are defined implicitly Use the second derivative to describe the behaviour of a function Solve problems involving connected rates of change and construct simple differential equations	2□ 4□ 6□ 8□ 13□ 15□ 19□ 25□ 28□ 33□ 38□ Y2P9_XMQs_and_MS.pdf	Y2P9 D1 (Shape of curves) Y2P9 D2 (Chain rule) Y2P9 D3 (Product and Quotient rules) Y2P9 FD1 (Differentiating exponentials and logs) Y2P9 FD2 (Differentiating trig) Y2P9 FD3 (Implicit differentiation)
Y2P10 Numerical methods Pre-req: Y2P3, Y2P9	10.1 Locating roots 10.2 Iteration 10.3 the Newton-Raphson method 10.4 Applications to modelling	Locate roots of $f(x) = 0$ by considering changes of sign Use iteration to find an approximation to the root of the equation $f(x) = 0$ Use the Newton-Raphson procedure to find approximations to the solutions of equations of the form $f(x) = 0$ Use numerical methods to solve problems in context	3□ 5□ 6□ 11□ 12□ Y2P10_XMQs_and_MS.pdf	Y2P10 N1 (Solving equations)
Y2P11 Integration Pre-req: Y1P13, Y2P1, Y2P9	11.1 Integrating standard functions 11.2 Integrating $f(ax+b)$ 11.3 Using trigonometric identities 11.4 Reverse chain rule 11.5 Integration by substitution 11.6 Integration by parts 11.7 Partial fractions 11.8 Finding areas 11.9 The trapezium rule 11.9 The trapezium rule 11.10 Solving differential equations 11.11 Modelling with differential equations 11.11 Integration Revision 11.11 Integration Revision	Integrate standard mathematical functions including trigonometric and exponential functions and use the reverse of the chain rule to integrate functions of the form $f(ax + b)$ Use trigonometric identities in integration Use the reverse of the chain rule to integrate more complex functions Integrate functions by making a substitution, using integration by parts and using partial fractions Use integration to find the area under a curve Use the trapezium rule to approximate the area under a curve Solve simple differential equations and model real-life situations with differential equations	2□ 5□ 7□ 13□ 15□ 19□ 20□ 22□ 25□ Y2P11_XMQs_and_MS.pdf	Y2P11 I1 (Finding areas) Y2P11 I2 (Substitution) Y2P11 I3 (Inspection) Y2P11 I4 (Parts) Y2P11 PE2 (Parametric differentiation and integration) Y2P11 DE1 (Differential equations) Y2P11 N2 (Numerical integration)
Y2P12 Vectors Pre-req: Y1P11	12.1 3D coordinates 12.1 3D coordinates 12.2 Vectors in 3D 12.3 Solving geometric problems 12.4 Application to mechanics	Understand 3D Cartesian coordinates Use vectors in three dimensions Use vectors to solve geometric problems Model 3D motion in mechanics with vectors	4□ 5□ 7□ 10□ 12□ Y2P12_XMQs_and_MS.pdf	Y2P12 V1 (Vectors in 3D)

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Y2S1 Regression, correlation and hypothesis testing Pre-req: Y1P14, Y1S4, Y1S7	1.1 Exponential models 1.2 Measuring correlation 1.3 Hypothesis testing for zero correlation	Understand exponential models in bivariate data Use a change of variable to estimate coefficients in an exponential model Understand and calculate the product moment correlation coefficient Carry out a hypothesis test for zero correlation	1□ 4□ 9□ 11□ Y2S1 XMQs and MS.pdf	Y2S1 H2 (Hypothesis testing for correlation)
Y2S2 Conditional probability Pre-req: Y1S5	2.1 Set notation 2.2 Conditional probability 2.3 Conditional probability in Venn diagrams 2.4 Probability formulae 2.5 Tree diagrams	Understand set notation in probability Understand conditional probability Solve conditional probability problems using two-way tables and Venn diagrams Use probability formulae to solve problems Solve conditional probability using tree diagrams	2□ 4□ 5□ 8□ Y2S2 XMQs and MS.pdf	Y2S2 P1 (Conditional probability)
Y2S3 The normal distribution Pre-req: Y1S6, Y1S7	3.1 The normal distribution 3.2 Finding probabilities for normal distributions 3.3 The inverse normal distribution 3.4 The standard normal distribution 3.5 Finding mu and sigma 3.6 Approximating a binomial distribution 3.7 Hypothesis testing with the normal distribution	Understand the normal distribution and the characteristics of a normal distribution curve Find percentage points on a standard normal curve Calculate values on a standard normal curve Find unknown means and/or standard deviations for a normal distribution Approximate a binomial distribution using a normal distribution Select appropriate distributions and solve real-life problems in context Carry out a hypothesis test for the mean of a normal distribution	2□ 4□ 5□ 8□ 11□ 17□ 21□ Y2S3 XMQs and MS.pdf	Y2S3 D1 (Normal distribution) Y2S3 H1 (Hypothesis testing with the normal distribution)
Y2M4 Moments Pre-req: Y1M10	4.1 Moments 4.2 Resultant moments 4.3 Equilibrium 4.4 Centres of mass 4.5 Tilting	Calculate the turning effect of a force applied to a rigid body Calculate the resultant moment of a set of forces acting on a rigid body Solve problems involving uniform rods in equilibrium Solve problems involving non-uniform rods Solve problems involving rods on the point of tilting	2□ 4□ 6□ 8□ 10□ 12□ Y2M4 XMQs and MS.pdf	Y2M4 M1 (Moments) Y2M4 M2 (Moments with angles)
Y2M5 Forces and friction Pre-req: Y1M10	5.1 Resolving forces 5.2 Inclined planes 5.3 Friction	Resolve forces into components Use the triangle law to find a resultant force Solve problems involving smooth or rough inclined planes Understand friction and the coefficient of friction Use $F = \mu R$	1□ 4□ 5□ 8□ 9□ Y2M5 XMQs and MS.pdf	Y2M5 F2 (Newton's second law in 2D) Y2M5 FR1 (Friction)
Y2M6 Projectiles Pre-req: Y1M9, Y1P10	6.1 Horizontal projection 6.2 Horizontal and vertical components 6.3 Projection at any angle 6.4 Projectile motion formulae	Model motion under gravity for an object projected horizontally Resolve velocity into components Solve problems involving particles projected at an angle Derive the formulae for time of flight, range and greatest height, and the equation of the path of a projectile	3□ 5□ 6□ 8□ Y2M6 XMQs and MS.pdf	Y2M6 P1 (Projectiles intro) Y2M6 P2 (Projectiles formulae)
Y2M7 Applications of forces Pre-req: Y2M4, Y2M5	7.1 Static particles 7.2 Modelling with statics 7.3 Friction and static particles 7.4 Static rigid bodies 7.5 Dynamics and inclined planes 7.6 Connected particles	Find an unknown force when a system is in equilibrium Solve statics problems involving weight, tension and pulleys Understand and solve problems involving limiting equilibrium Solve problems involving motion on rough or smooth inclined planes Solve problems involving connected particles that require the resolution of forces	1□ 3□ 4□ 7□ 8□ 10□ 13□ 16□ Y2M7 XMQs and MS.pdf	Y2M7 F2 (Newton's second law in 2D)
Y2M8 Further kinematics Pre-req: Y1P11, Y2P11, Y1M9	8.1 Vectors in kinematics 8.2 Vector methods with projectiles 8.3 Variable acceleration in one dimension 8.4 Differentiating vectors 8.5 Integrating vectors	Work with vectors for displacement, velocity and acceleration when using the vector equations of motion Use calculus with harder functions of time involving variable acceleration Differentiate and integrate vectors with respect to time	3□ 5□ 9□ 11□ 17□ Y2M8 XMQs and MS.pdf	Y2M8 K1 (Motion in 2D)