ProRevise

Edexcel A Level MATHEMATICS

Pure and Applied Mathematics

Topic Checklist

PURE MATHEMATICS 1

Topic	Subtopic	LEARN	RECALL	APPLY
1. Algebraic expressions	1.1 Index laws			
	1.2 Expanding brackets			
	1.3 Factorising			
	1.4 Negative and fractional indices			
	1.5 Surds			
	1.6 Rationalising denominators			
2. Quadratics	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			
3. Equations and inequalities	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			
4. Graphs and transformations	4.1 Cubic graphs			
	4.2 Quartic graphs			
	4.3 Reciprocal graphs			
	4.4 Points of intersection			

	4.5 Translating graphs			
	4.6 Stretching graphs			
	4.7 Transforming functions			
5. Straight line graphs	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			
6. Circles	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			
7. Algebraic methods	7.1 Algebraic fractions			
	7.2 Dividing polynomials			
	7.3 The factor theorem			
	7.4 Mathematical proof			
	7.5 Methods of proof			
8. The binomial expansion	8.1 Pascal's triangle			
	8.2 Factorial notation			
	8.3 The binomial expansion			
	8.4 Solving binomial problems			
	8.5 Binomial estimation			
9. Trigonometric ratios	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			
10. Trigonometric identities and equations	10.1 Angles in all four quadrants			
	10.2 Exact value of trigonometric ratios			
	10.3 Trigonometric identities			
	10.4 Simple trigonometric equations			
	10.5 Harder trigonometric equations			
	10.6 Equations and identities			
11. Vectors	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			
12. Differentiation	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 normal			
	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			
13. Integration	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			
14. Exponentials and logarithms	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			

APPLIED MATHEMATICS 1

Topic	Subtopic	LEARN	RECALL	APPLY
1. Data collection	1.1 Population and samples			
	1.2 Sampling			
	1.3 Non-random sampling			
	1.4 Types of data			
	1.5 The large data set			
2. Measures of location and spread	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			
3. Representations of data	3.1 Outliers			
	3.2 Box plots			
	3.3 Cumulative frequency			
	3.4 Histograms			
	3.5 Comparing data			
4. Correlation	4.1 Correlation			
	4.2 Linear regression			
5. Probability	5.1 Calculating probabilities			
	5.2 Venn diagrams			
	5.3 Mutually exclusive and independent events			
	5.4 Tree diagrams			
6. Statistical distributions	6.1 Probability distributions			
	6.2 The binomial distribution			

	6.3 Cumulative probabilities			
7. Hypothesis testing	7.1 Hypothesis testing			
	7.2 Finding critical values			
	7.3 One-tailed tests			
	7.4 Two-tailed tests			
8. Modelling in mechanics	8.1 Constructing a model			
	8.2 Modelling assumptions			
	8.3 Quantities and units			
	8.4 Working with vectors			
9. Constant acceleration	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			
10. Forces and motion	10.1 Force diagrams			
	10.2 Forces as vectors			
	10.3 Force and acceleration			
	10.4 Motion in 2 dimensions			
	10.5 Connected particles			
	10.6 Pulleys			
11. Variable acceleration	11.1 Functions of time			
	11.2 Using differentiation			
	11.3 Maxima and minima problems			
	11.4 Using integration			
	11.5 Constant acceleration formulae			

PURE MATHEMATICS 2

Topic	Subtopic	LEARN	RECALL	APPLY
1. Algebraic methods	1.1 Proof by contradiction			
	1.2 Algebraic functions			
	1.3 Partial fractions			
	1.4 Repeated factors			
	1.5 Algebraic division			
2. Functions and graphs	2.1 The modulus function			
	2.2 Functions and mappings			
	2.3 Composite functions			
	2.4 Inverse functions			
	2.5 $y = \|f(x)\|$ and $y = f(\|x\|)$			
	2.6 Combining transformations			
	2.7 Solving modulus problems			
3. Sequences and series	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			
4. Binomial expansion	4.1 Expanding $(1 + x)^n$			
	4.2 Expanding $(a + bx)^n$			
	4.3 Using partial fractions			
	4.4 Transforming functions			
5. Radians	5.1 Radian measure			

	5.2 Arc length			
	5.3 Areas of sector and segments			
	5.4 Solving trigonometric equations			
	5.5 Small angle approximations			
6. Trigonometric functions	6.1 Secant, cosecant and cotangent			
	6.2 Graphs of sec(x), cosec(x) and cot(x)			
	6.3 Using sec(x), cosec(x), and cot(x)			
	6.4 Trigonometric identities			
	6.5 Inverse trigonometric functions			
7. Trigonometry and modelling	7.1 Addition formulae			
	7.2 Using the angle addition formulae			
	7.3 Double-angle formulae			
	7.4 Solving trigonometric equations			
	7.5 Simplifying a cos(x) ± b sin(x)			
	7.6 Proving trigonometric identities			
	7.7 Modelling with trigonometric functions			
8. Parametric equations	8.1 Parametric equations			
	8.2 Using trigonometric identities			
	8.3 Curve sketching			
	8.4 Points of intersection			
	8.5 Modelling with parametric equations			
9. Differentiation	9.1 Differentiation 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			
10. Numerical methods	10.1 Locating roots			
	10.2 Iteration			
	10.3 The Newton-Raphson method			
	10.4 Applications to modelling			
11. Integration	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			
	11.10 Solving differential equations			
	11.11 Modelling with differential equations			
	11.12 Integration as the limit of a sum			
12. Vectors	12.1 3D coordinates			
	12.2 Vectors in 3D			
	12.3 Solving geometric problems			
	12.4 Application to mechanics			

APPLIED MATHEMATICS 2

Topic	Subtopic	LEARN	RECALL	APPLY
1. Regression, correlation and hypothesis testing	1.1 Exponential models			
	1.2 Measuring correlation			
	1.3 Hypothesis testing for zero correlation			
2. Conditional probability	2.1 Set notation			
	2.2 Conditional probability			
	2.3 Conditional probabilities in Venn diagrams			
	2.4 Probability formulae			
	2.5 Tree diagrams			
3. The normal distribution	3.1 The normal distribution			
	3.2 Finding probabilities for normal distributions			
	3.3 The inverse normal distribution function			
	3.4 The standard normal distribution			
	3.5 Finding μ and σ			
	3.6 Approximating a binomial distribution			
	3.7 Hypothesis testing with the normal distribution			
4. Moments	4.1 Moments			
	4.2 Resultant moments			
	4.3 Equilibrium			
	4.4 Centres of mass			
	4.5 Tilting			
5. Forces and friction	5.1 Resolving forces			

	5.2 Inclined planes			
	5.3 Friction			
6. Projectiles	6.1 Horizontal projection			
	6.2 Horizontal and vertical components			
	6.3 Projection at any angle			
	6.4 Projectile motion formulae			
7. Applications of forces	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			
8. Further kinematics	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			