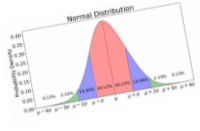




AQA 7357
PAPER 1 – 2hr
PAPER 2 – 2hr
PAPER 3 – 2hr

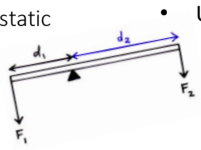
Statistical Hypothesis Testing:

- Normal distribution
- Links to histograms and standard deviation
- Real-life examples.



Moments

- Quantities and Units of moments
- Moments in static contexts.



Statics and Dynamics:

- Resultant forces in a plane
- Models of friction
- Using the coefficient of friction

Equilibrium and Resolving:

- Resolving forces in 2D
- Equilibrium of a particle.

Kinematics in 2 Dimensions

- Calculus for kinematics in 2D
- Motion under gravity.

Further Probability:

- Conditional probability and formulae
- Venn diagrams, tree diagrams and 2-way tables.
- Critiquing assumptions from modelling processes.

	Sport Utility Vehicle (SUV)	Sports Car	Totals
male	21	39	60
female	135	45	180
Totals	156	84	240

Trigonometry:

- Trig identities and formulae
- Double angle and addition formula
- R-Alpha Method

Differential equation (derivative)
 $y + \frac{dy}{dx} = 5x$

Numerical Methods:

- Change of sign method
- Iteration and Newton-Raphson method
- Trapezium Rule

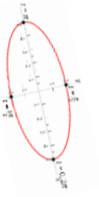
$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)}$$

Differential Equations

- Separating Variables to solve differential equations.
- Finding particular solutions
- Interpreting differential equations in a real life context.

Parametric Equations

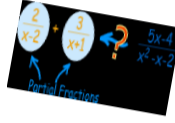
- Sketching parametric graphs
- Differentiating parametric equations
- Converting to Cartesian form.



$$\int u dv = uv - \int v du$$

Partial Fractions and Integrations:

- Decompose rational functions into partial fractions.
- Integrate partial fractions.



Functions and Transformations:

- Rational expressions and algebraic division
- Modulus functions
- Composite functions and their inverses
- Recap of graph transformations.

Trigonometry and Circular Measure:

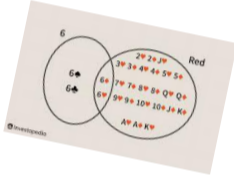
- Arc length and sector area
- Small angle approximations
- Definitions of Arcsine, arccos, arctan
- Graphs of $y = \sec x$, $y = \cot x$, $y = \operatorname{cosec} x$
- Deriving trigonometric identities.



Further Differentiation

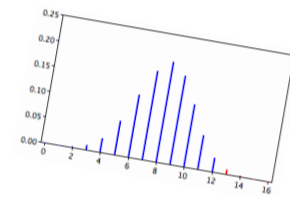
- Product and Quotient Rule
- Chain Rule and connected rate of change

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$



Binomial, Sequences and Series

- Arithmetic and Geometric sequences
- Sequences and series in modelling



YEAR 13
A-LEVEL

Hypothesis Testing:

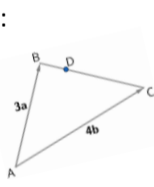
- Understanding what a hypothesis test is.
- Binomial hypothesis testing- 1 and 2 tailed.
- Interpretation of results.

Data Interpretation:

- Histograms
- Scatter graphs and correlations
- Standard Deviation
- Outliers
- Evaluating data and its meaning.

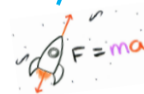


- Kinematics in One Dimensions:
- Distance/Time and Speed/Time graphs
 - SUVAT equations in real life
 - Calculus in kinematics



Force & Newton's Laws of Motion

- Newton's 1st Law and diagrams
- Newton's 2nd Law $F=ma$
- Pulleys and connected particles



Proof:

- Structure of mathematical proof
- Proof by contradiction
- Proof of $\sqrt{2}$ being irrational

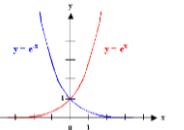
$$\sqrt{2}$$

Vectors:

- Use vectors in 2D and 3D
- Magnitude and direction of vectors
- Position vectors with diagrams.

Exponentials and Logarithms:

- Understand the graphs of exponentials and logarithms
- Differentiate these functions
- Laws for logs
- Exponential growth and decay



Statistical Sampling:

- Understanding populations and samples.
- Sampling techniques and their advantages and disadvantages.



Differentiation Application:

- Find stationary points and determine their nature
- Increasing and decreasing functions.
- Optimisation problems.

Differentiation Basics:

- Notation for differentiation
- Find first and second derivatives of functions
- Differentiation by first principles.

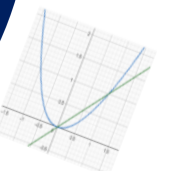
$$x^2 + 4x - 5 > 0$$

Inequalities:

- Solving Linear and quadratic inequalities
- Graphical regions of inequalities
- Range of solutions for multiple inequalities.

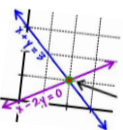
Graphs and Transformations:

- Properties of linear, quadratic and cubic graphs
- Functions in the form $y=a/x$ and $y=a/x^2$
- Transformations of graphs including stretches, translations and reflections.



Simultaneous Equations:

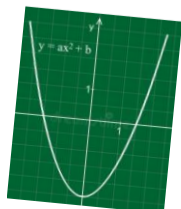
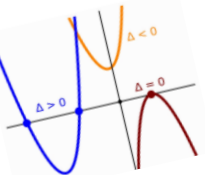
- Links between solutions of two equations and their intersections.
- Linear and quadratic simultaneous equations
- The link of the discriminant of two solutions.



$$\begin{cases} x^2 + y^2 = 29 \\ y - x = 3 \end{cases}$$

Quadratic Functions:

- Sketching quadratic graphs accurately
- Features of a quadratic graph including lines of symmetry and roots.
- The discriminant of a quadratic and the links to roots.
- Completing the square including in the form ax^2+bx+c
- Hidden quadratics and solutions.
- Using the quadratic formula to find roots.

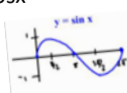


Circles and Lines:

- Straight line equations in form: $(y-y_1)=m(x-x_1)$, $ax+bx+c=0$
- Equations of circles in form $(x-a)^2+(y-b)^2=r^2$
- Circle theorems and properties.

Trigonometry:

- Properties of graphs $y=\sin x/\cos x/\tan x$
- Area of triangle using $1/2ab\sin C$
- Trigonometric Identities: $\tan x = \sin x/\cos x$ and $\sin 2x + \cos 2x = 1$
- Solve trigonometric equations.



Integration:

- Integrate functions in form x^n and related differences
- Find definite and indefinite integrals
- Integration to find areas under a curve.

Binomial Expansion:

- Find expansions of the form $(a+bx)^n$, where n is an integer.
- Find the coefficients of particular powers of x .

$$(a+b)^n = \binom{n}{0}a^n + \binom{n}{1}a^{n-1}b + \binom{n}{2}a^{n-2}b^2 + \dots + \binom{n}{n}b^n$$

Teacher B

Teacher A

YEAR 12
A-LEVEL

Surds:

- Demonstrate how to manipulate surds
- Rationalise a denominator
- Answer algebraic questions

$$\begin{aligned} \sqrt{ab} &= \sqrt{a} \times \sqrt{b} \\ \sqrt{a} \times \sqrt{a} &= a \\ \sqrt{a} \div \sqrt{b} &= \sqrt{a/b} \end{aligned}$$

Laws of Indices:

- Understand all laws for indices
- Apply these to problem solving examples.

$$x^a \times x^b = x^{a+b} \quad x^{-a} = \frac{1}{x^a}$$