

Year Group: 12

Pure Mathematics

1. Algebra

- Algebraic Expressions
- Laws of Indices
- Surds

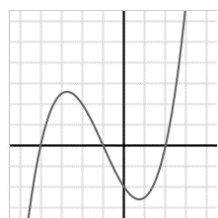
$$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$$

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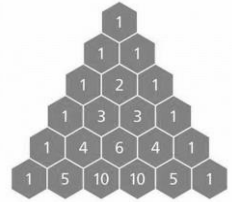
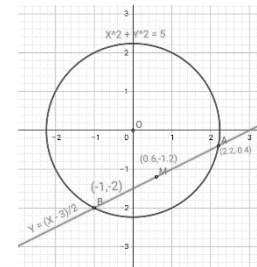
2. Quadratics and Cubics

- Solving Quadratic Equations
- Functions and Roots
- Quadratic Graphs
- Factorising Cubics



3. Coordinate Geometry, Graphs and Circles

- Equation of a Straight Line
- Parallel and Perpendicular Lines
- Proportion
- Curve Sketching
- Transformations of Graphs
- Circles



4. The Binomial Expansion

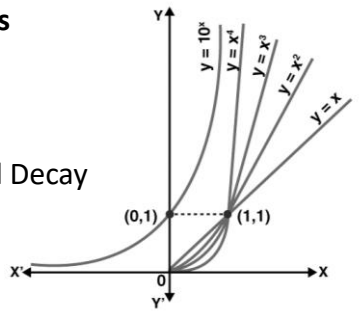
- Pascal's Triangle
- The Binomial Expansion

Assessment Window 2



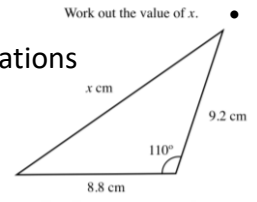
7. Exponentials and Logarithms

- Exponentials
- Logs
- Solving Equations with Logs
- Modelling Exponentials and Decay
- Using Log Graphs



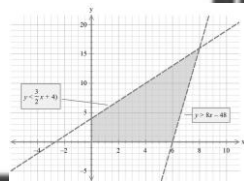
6. Trigonometry

- Sine and Cosine Rules
- Trig Identities
- Trig Functions
- Solving Trig Equations



5. Inequalities and Simultaneous Equations

- Quadratic Inequalities
- Solving Simultaneous Equations

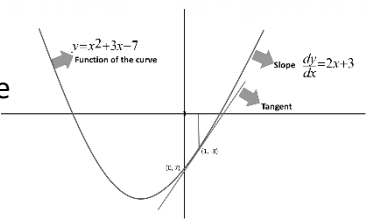


Assessment Window 1



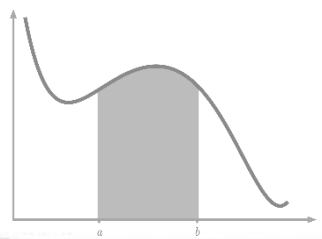
8. Differentiation

- The Gradient of a Curve
- Differentiating $y = f(x)$
- Using Differentiation
- Real Life Problems



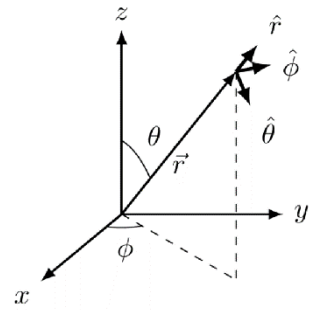
9. Integration

- Indefinite Integration
- Definite Integration



10. Vectors

- Vectors
- Calculating with Vectors
- Modelling with Vectors



Assessment Window 3

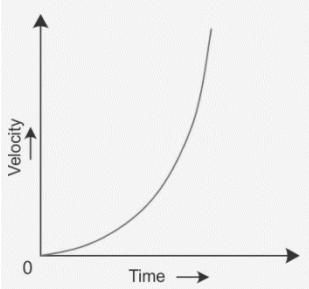


CAREERS: At every available opportunity, teachers will introduce and promote careers links to the topics being studied (See Careers booklets).

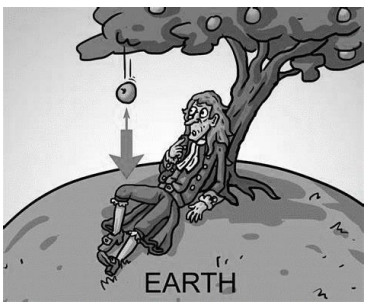
Year Group: 12

Applied Mathematics

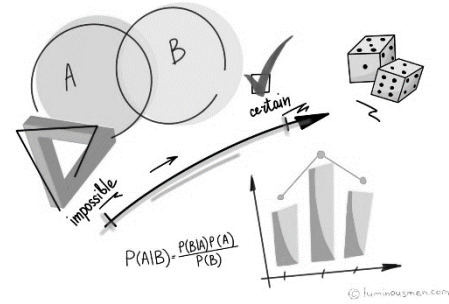
- 1. Mechanics - Kinematics**
- Motion Graphs
 - Constant Acceleration Equations
 - Non-Uniform Acceleration



- 2. Mechanics – Forces and Newton’s Laws**
- Understanding Units
 - Models in Mechanics
 - Forces
 - Newton’s Laws of Motion



- 4. Statistics - Statistical Distributions**
- Probability Distributions
 - Binomial Distributions
 - Binomial Cumulative Distribution Function
 - Modelling Real Problems

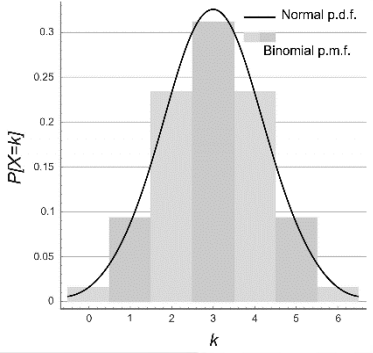


- 3. Statistics - Probability**
- Elementary Probability
 - Solving Probability Problems
 - Laws of Probability

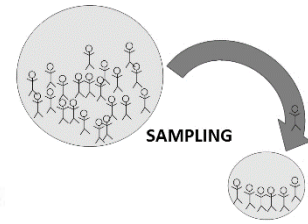
Assessment Window 2



- 5. Statistics - Statistical Hypothesis Testing**
- Hypothesis Tests
 - Hypothesis Tests for a Binomial Distribution



- 6. Statistics - Sampling, Data Presentation and Interpretation**
- Populations and Sampling
 - Representing Data
 - Measures of Location
 - Measures of Dispersion
 - Correlation and Regression



Assessment Window 3



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Pure Mathematics

1. Algebra

- Proof
- Simplifying expressions
- Mappings and Functions
- Composite & Inverse functions
- Modulus
- Transformations
- Partial Fractions

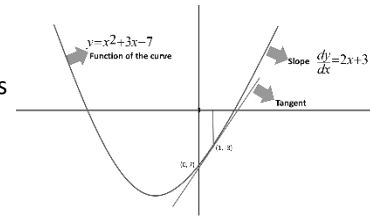
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2. Trigonometry

- Arcs and Sectors
- Small angle approx.
- Inverse trig functions
- Cosc, sec, cot
- Identities
- Addition Formula
- Double Angle
- R Addition
- Modelling



3. Differentiation 2

- Points of inflection
- Chain rule
- Differentiation of e and ln
- Differentiation of Trig functions
- Product and Quotient rule
- Connected rates of change
- Parametric differentiation
- Implicit differentiation

Assessment Window 1

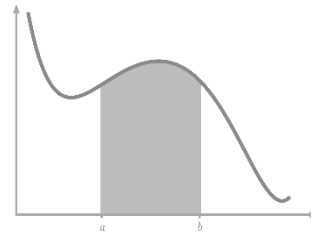


Assessment Window 2



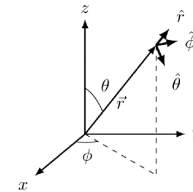
6. Parametric equations

- Parametric equations of curves
- Parametric and Cartesian equations



5. Integration 2

- Integration of $(ax + b)^n$
- Integration of e and $\ln x$
- Trig integration
- 3 x inspection methods
- Trig identities in integration
- Finding areas
- Parametric integration
- Integration by substitution
- Integration by parts
- Integration using partial fractions
- Differential equations



4. Vectors 2

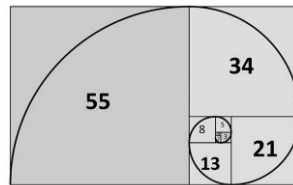
- Vectors in 3D
- Calculating with Vectors

Assessment Window 3



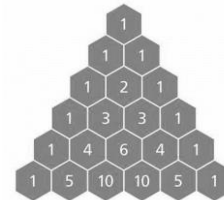
7. Sequences and series

- Sequences
- Arithmetic sequences
- Arithmetic series
- Geometric sequences and series
- Modelling problems



8. Binomial Expansion 2

- Binomial expansion
- Binomial expansion as approximations
- Binomial expansion and partial fractions



9. Numerical methods

- Location of roots
- Iterative methods
- Sketching iterations
- Newton-Raphson Method
- Trapezium rule

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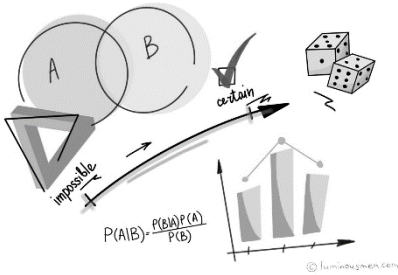
Applied Mathematics

1. Statistics – Correlation and Regression

- Regression
- The PMCC

2. Statistics – Probability 2

- Conditional Probability
- Modelling with Probability.

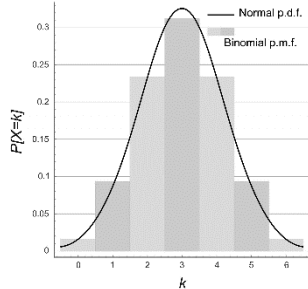


Assessment Window 1



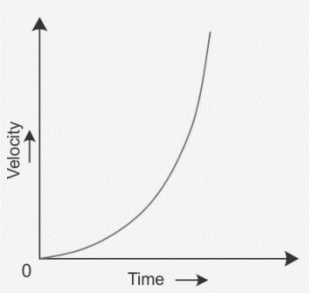
3. Statistics – The Normal Distribution

- The Normal Distribution
- Normal Approximation to Binomial
- Choosing Probability Distributions
- Hypothesis tests of the mean of a population.



4. Mechanics - Kinematics 2

- Projectiles
- Non-uniform acceleration in 2D

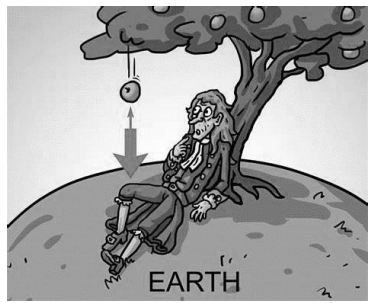


Assessment Window 2



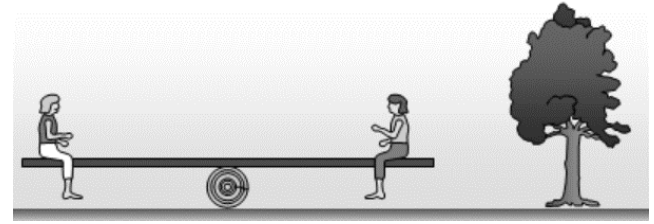
5. Mechanics – Dynamics

- Resolving forces
- Friction
- Newton’s Laws of Motion



6. Mechanics – Moments

- Moments
- Reaction Forces and Friction in Moments



Assessment Window 3



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