

MATH A2

OCRA

PURE

① Proof & Math conns

- 1) Methods (proof)
- 2) Proof by contradiction
- 3) Critiquing proofs

② Functions

- 1) Mappings & Func's
- 2) Domain & Range
- 3) Composite functions
- 4) Inverse functions

③ Further transformations (graphs)

- 1) Combined transformations
- 2) Modulus function
- 3) Modulus equations & ineq.

④ Sequences & Series

- 1) General sequences
- 2) General series & σ notation
- 3) Arithmetic seq.
- 4) Arithmetic series
- 5) Geometric seq.
- 6) Geometric series
- 7) ∞ Geometric series
- 8) Using seq. & series to solve

⑤ Rational functions & partial fractions

- 1) Factor theorem
- 2) Simplifying rational expressions
- 3) Partial fractions w/ distinct factors
- 4) Partial fractions w/ repeated factors

⑥ General binomial expansion

- 1) General binomial expansion
- 2) Binomial expansions (compound expressions)

⑦ Radian measure

- 1) Introducing radian measure
- 2) Inverse trig. func. & solving trig. eq's
- 3) Modelling w/ trig. func.
- 4) Arcs & Sectors
- 5) Triangles & Circles
- 6) Small angle approx.

⑧ Further Trig.

- 1) Compound angle identities
- 2) $\times 2$ angle identities
- 3) $a \sin x + b \cos x$
- 4) Reciprocal trig. func.

⑨ Calculus (exponential & trig. func.)

- 1) Differentiation
- 2) Integration

⑩ Further differentiation

- 1) Chain rule
- 2) Product rule
- 3) Quotient rule
- 4) Implicit differentiation
- 5) Differentiate inverse func.

⑪ Further Integration

- 1) Reversing standard deriv.
- 2) Integ. by sub.
- 3) Integ. by parts
- 4) Trig. identities in integration
- 5) Integrating rational functions

⑫ Further applications (Calculus)

- 1) Properties (Curves)
- 2) Parametric eq.
- 3) Related $\frac{dy}{dx} \Delta$
- 4) More complicated areas

⑬ Differential equations

- 1) Intro.
- 2) Separable differential eq.
- 3) Modelling w/ em

⑭ Numerical solution (Equations)

- 1) Locate roots (function)
- 2) Newton-Raphson method
- 3) Limitations (Newton-Raphson method)
- 4) Fixed point iteration
- 5) Limits (fixed point iteration; alternative rearrangements)

⑮ Numerical Integration

- 1) Integ. as lin. (Σ)
- 2) Trapezium rule

STAT

⑯ Conditional probability

- 1) Set notation & Venn diagrams
- 2) 2-way tables
- 3) Tree diagrams
- 4) Modelling w/ probability

⑰ Normal distribution

- 1) Intro. to normal probab.
- 2) Inverse normal distrib.
- 3) Finding !known $\mu // \sigma$
- 4) Modelling w/ norm. distrib.

⑱ Further hypothesis testing

- 1) Distrib. (sample Σ)
- 2) Hypothesis testing (Σ)
- 3) Hypothesis testing (correl. coef.)

MECH

⑲ Applications (Vectors)

- 1) Motion in 2D
- 2) Constant accel. eqns
- 3) Units of vectors
- 4) Vectors in 3D
- 5) Solving geometrical problems

⑳ Projectiles

- 1) Modelling projectile motion
- 2) Trajectory (projectile)

㉑ Forces in context

- 1) Resolving forces
- 2) Coef. (friction)
- 3) Motion on slope
- 4) Further equilibrium stuff

㉒ Moments

- 1) Turning fx (force)
- 2) Equilibrium
- 3) !uniform rods
- 4) Further eq. stuff