
GCSE: AQA Level 2 FURTHER MATHS TOPICS FOR AUTOGRAPH [Apr 2023]

References to AQA GCSE Further Mathematics

Red items not yet implemented in Web-Autograph
Grey items not suitable for dynamic visualisation

NUMBER

1.1 Integers; surds

ALGEBRA

2.1 Function notation; Domain and range
Composite functions; Inverse functions

2.6 Expanding/factorising; Rational expressions
Completing the square

2.14 Graphs: linear, quadratic, exponential
Piecewise graphs

2.15 Linear/non-linear intersections

2.16 Solve 3 linear equations in 3D

2.17 Linear, quadratic inequalities

2.18 Law of indices; Sequences

2D COORDINATE GEOMETRY

3.1 Gradient, parallel/perpendicular
Distance between 2 points; ratio

3.5 Straight line: $y=mx+c$, $y-y_1=m(x-x_1)$

3.7 The circle: $(x-a)^2+(y-b)^2=r^2$
Circle properties, radius, tangent
Equation of a tangent at a point on a circle

CALCULUS

4.1 dy/dx: gradient of a curve, gradient of tangent
Differentiate $y = kx^n$, $(3x+2)(x-3)$, $5/x^3$
Equation of tangent and normal

4.5 Increasing and decreasing functions
Second derivative

4.8 Finding max and min points on a curve;
Sign of second derivative
Interpret a curve with given max and min

MATRIX TRANSFORMATIONS

5.1 Matrix arithmetic; identity matrix

5.3 Transformation of unit square:
Rotation 90°, 180°, 270°
Reflection in x=0. y=0, y=x, y=−x
Enlargement centred on origin
Combination of transformations

GEOMETRY

6.1 2D: Perimeter, area: rectangles, circles, triangles, parallelograms, trapezia
3D: Area, volume: prisms, cylinders, spheres, cones, pyramids

6.1 Angles: line, triangle, quadrilateral, polygon
Circle th. angle at centre, same segment, cyclic quad. , alternate segment theorem

6.3 Sine, cosine rules; area of triangle=½absinC
Pythagoras' Theorem in 2D and 3D
Pythagorean triples (TSM-Resources)

6.6 Graphs of sinx, cosx, tanx;
$\tan x=\sin x/\cos x$, $\sin^2 x+\cos^2 x=1$
Solving simple trig equations

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GCE: CORE MATHS Level 3 TOPICS FOR AUTOGRAPH [Apr 2023]

References to Core Mathematics AMSP

- interpreting solutions in the context of the problem
- understanding sources of error and bias when problem-solving

- working with data
- understanding risk and probability
- understanding variation in statistics
- using exponential functions to model growth and decay

Most Core Maths qualifications also include:

- percentage change
- interpretation of graphs
- financial maths
- using standard units
- Fermi estimation

- the Normal distribution
- correlation
- modelling, problem solving

Douglas Butler, April 2023