A guide to use GeoGebra when teaching AS and A level Mathematics

Below you can find links to GeoGebra files designed to help you teach the content of AS and A level Mathematics qualifications with the aid of GeoGebra.

These can be used for teaching, or as students' aided or independent learning materials with Pearson Textbooks.

AS Mathematics

Pure Mathematics	Statistics	Mechanics

A level Mathematics

Pure Mathematics	Statistics	Mechanics

AS Mathematics – Pure Mathematics

Quadratics (Chapter 2)

Explore how the graph of $y = (x + p)^2 + q$ changes as the values of p and q change. (Page 28)
• GeoGebra interactive

Explore how the value of the discriminant changes with k. (Page 31)
• GeoGebra interactive

Explore the trajectory of the spear. (Page 33)
• GeoGebra interactive

Equations and inequalities (Chapter 3)

Find the point of intersection graphically. (Page 43)
• GeoGebra interactive

Plot the curve and the line to find the two points of intersection. (Page 43)
• GeoGebra interactive

Explore how the value of k affects the line and the curve. (Page 44)
• GeoGebra interactive

Explore which regions on the graph satisfy which inequalities. (Page 54)
• GeoGebra interactive

AS Mathematics – Pure Mathematics (Cont'd)

Graphs and transformations (Chapter 4)

Explore the graph of $y = (x - p)(x - q)(x - r)$ where p, q and r are constants. (Page 60)
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Explore the graph of $y = (x - p)(x - q)(x - r)(x - s)$ where p, q, r and s are constants. (Page 64)
• GeoGebra interactive

Explore the graph of $y = \frac{a}{x}$ for different values of a. (Page 67)
• GeoGebra interactive

Explore translations of the graph of $y = x^3$. (Page 72)
• GeoGebra interactive

Explore stretches of the graph of $y = x(x - 2)(x + 1)$. (Page 77)
• GeoGebra interactive

Straight line graphs (Chapter 5)

Explore the gradient formula. (Page 90)
• GeoGebra interactive

Explore lines of a given gradient passing through a given point. (Page 94)
• GeoGebra interactive

Plot the solution of a straight line graphs problem on a graph. (Page 95)
• GeoGebra interactive

Explore changes in the solution of a straight line graphs problem when the original line and point are varied. (Page 98)
• GeoGebra interactive

Draw both straight lines and the triangle AOB on a graph. (Page 101)
• GeoGebra interactive

AS Mathematics – Pure Mathematics (Cont'd)

Circles (Chapter 6)

Explore the general form of the equation of a circle. (Page 117)
• GeoGebra interactive

Explore intersections of straight lines and circles. (Page 121)
• GeoGebra interactive

Explore the circle theorems. (Page 123)
• GeoGebra interactive

Explore triangles and their circumcircles.
• GeoGebra interactive

The binomial expansion (Chapter 8)

Find the values of x for which the first four terms of this expansion give a good approximation to the value of the function. (Page 130)
• GeoGebra interactive

Trigonometric ratios (Chapter 9)

Explore the cosine rule. (Page 174)
• GeoGebra interactive

Explore the sine rule. (Page 179)
• GeoGebra interactive

Explore the area of a triangle. (Page 186)
• GeoGebra interactive

Explore the solution of a trigonometric ratios problem step-by-step. (Page 189)
• GeoGebra interactive

Plot transformations of trigonometric graphs. (Page 197)
• GeoGebra interactive

AS Mathematics – Pure Mathematics (Cont'd)

Trigonometric identities and equations (Chapter 10)

Explore the values of sin θ, cos θ and tan θ for any angle θ in a unit circle. (Page 203)
• GeoGebra interactive

Vectors (Chapter 11)

Explore vector addition. (Page 321)
• GeoGebra interactive

Explore this solution as a vector diagram on a coordinate grid. (Page 237)
• GeoGebra interactive

Explore the magnitude of a vector. (Page 239)
• GeoGebra interactive

Use GeoGebra to show that diagonals of a parallelogram bisect each other. (Page 245)
• GeoGebra interactive

Differentiation (Chapter 12)

Explore the gradient of the chord on a graph to introduce the gradient of a tangent. (Page 257)
• GeoGebra interactive

Explore the tangent and normal to the curve. (Page 269)
• GeoGebra interactive

Explore increasing and decreasing functions using GeoGebra. (Page 271)
• GeoGebra interactive

Explore the solution of a differentiation stationary point problem. (Page 274)
• GeoGebra interactive

Explore the key features linking $y = f(x)$ and $y = f'(x)$. (Page 277)
• GeoGebra interactive

AS Mathematics – Pure Mathematics (Cont'd)

Integration (Chapter 13)

Explore how the value of c affects a curve. (Page 294)
• GeoGebra interactive

Exponentials and logarithms (Chapter 14)

Explore the relationship between exponential functions and their derivatives. (Page 314)
• GeoGebra interactive

Use GeoGebra to draw transformations of $y = e^x$. (Page 316)
• GeoGebra interactive

AS Mathematics – Statistics

Representations of data (Chapter 3)

Explore box plots and outliers. (Page 44)
• GeoGebra interactive

Explore the regression line and analysis. (Page 64)
• GeoGebra interactive

Explore the cumulative probabilities for the binomial distribution. (Page 93)
• GeoGebra interactive

Explore the locations of the critical values for each tail in a hypothesis testing. (Page 103)
• GeoGebra interactive

AS Mathematics – Mechanics

Modelling in mechanics (Chapter 8)

Explore how the area of the trapezium changes as the value of t changes in a velocity-time graph.
• GeoGebra interactive

A level Mathematics – Pure Mathematics

Functions and graphs (Chapter 2)

Explore graphs of f(x) and |f(x)|. (Page 24)
• GeoGebra interactive

Explore intersections of straight lines and modulus graphs. (Page 25)
• GeoGebra interactive

Explore graphs of functions on a given domain. (Page 29)
• GeoGebra interactive

Explore functions and their inverses. (Page 37)
• GeoGebra interactive

Explore graphs of modulus functions y = |f(x)| and y = f(|x|). (Page 40)
• GeoGebra interactive

Explore combinations of transformations of the function f(x) = ln x. (Page 46)
• GeoGebra interactive

Explore the solution to an inequality of a modulus function problem. (Page 51)
• GeoGebra interactive

Binomial expansion (Chapter 4)

Explore why the expansions of are only valid for certain values of x. (Page 93)
• GeoGebra interactive

A level Mathematics – Pure Mathematics (Cont'd)

Radians (Chapter 5)

Explore the arc length of a sector. (Page 129)
• GeoGebra interactive

Explore the area of a sector. (Page 120)
• GeoGebra interactive

Explore the area of a segment. (Page 123)
• GeoGebra interactive

Explore approximate values of sin θ. cos θ and tan θ for values of θ close to 0. (Page 133)
• GeoGebra interactive

Explore transformations of the graphs of reciprocal trigonometric functions. (Page 147)
• GeoGebra interactive

Trigonometry and modelling (Chapter 7)

Explore the proof step-by-step of the addition formulae using a geometric construction. (Page 168)
• GeoGebra interactive

Explore how you can transform the graphs of $y = \sin x$ and $y = \cos x$ to obtain the graph of $y = 3 \sin x + 4 \cos x$. (Page 182)
• GeoGebra interactive

Explore maximums and minimums of curves in the form $R \cos (\theta - \alpha)$. (Page 184)
• GeoGebra interactive

Explore the solution to a modelling problem graphically modelling cabin pressure against time spent at cruising altitude. (Page 189)
• GeoGebra interactive

A level Mathematics – Pure Mathematics (Cont'd)

Parametric equations (Chapter 8)

Explore a parametric curve and the cartesian equivalent. (Page 199)
• GeoGebra interactive

Graphing parametric equations using trigonometric identities. (Page 203)
• GeoGebra interactive

Graphing parametric equations using trigonometric identities. (Page 204)
• GeoGebra interactive

Graphing parametric equations. (Page 207)
• GeoGebra interactive

Explore parametric equations with a variable coefficient. (Page 209)
• GeoGebra interactive

Explore the motion of a figure skater over time by modelling with parametric equations. (Page 217)
• GeoGebra interactive

Differentiation (Chapter 9)

Explore the relationship between sin and cos and their derivatives. (Page 232)
• GeoGebra interactive

Explore the function a^x and its derivative. (Page 235)
• GeoGebra interactive

Explore the graph of $y = \frac{sinx}{e^{2x}}$. (Page 243)
• GeoGebra interactive

Explore the graph of a curve with parametric equations and the normal at a point. (Page 250)
• GeoGebra interactive

Explore whether a cubic curve is concave or convex on a given interval and find the point of inflection. (Page 259)
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A level Mathematics – Pure Mathematics (Cont'd)

Differentiation (Chapter 9) (Cont'd)

Locate the root of f(x) = ln x – 1/x. (Page 276)
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Explore the use of iteration to find the roots of an equation. (Page 280)
• GeoGebra interactive

Explore how the Newton–Raphson method works graphically and algebraically. (Page 284)
• GeoGebra interactive

Integration (Chapter 11)

Explore the area between two curves. (Page 314)
• GeoGebra interactive

Explore under- and over- estimation when using the trapezium rule. (Page 319)
• GeoGebra interactive

Explore the relationship between the general solution, the possible boundary conditions, the value of , and the particular solution.. (Page 323)
• GeoGebra interactive

Explore the general and particular solutions to a differential equation. (Page 326)
• GeoGebra interactive

Explore 3D coordinates, the relationship between a changing z coordinate and the length of the line associated to the points. (Page 339)
• GeoGebra interactive

Explore the solution to a 3D problem visually, showing the vectors, magnitude and triangle. (Page 342)
• GeoGebra interactive

Explore the solution to a 3D problem visually, showing the vectors, lines and quadrilateral. (Page 345)
• GeoGebra interactive

A level Mathematics – Statistics

Regression, correlation and hypothesis testing (Chapter 1)

Explore the original and coded data graphically. (Page 3)
• GeoGebra interactive

Conditional probability (Chapter 2)

Explore set notation on a Venn diagram. (Page 17)
• GeoGebra interactive

The normal distribution (Chapter 3)

Explore the normal distribution curve. (Page 40)
• GeoGebra interactive

A level Mathematics – Mechanics

Moments (Chapter 4)

Explore the moment of a force acting about a point. (Page 71)
• GeoGebra interactive

Explore the moment acting about pivot M. (Page 80)
• GeoGebra interactive

Explore the moment acting about pivot M. (Page 83)
• GeoGebra interactive

Forces and friction (Chapter 5)

Explore the resultant of two forces. (Page 94)
• GeoGebra interactive

Explore a problem with different masses, slopes and frictional coefficients. (Page 102)
• GeoGebra interactive

A level Mathematics – Mechanics (Cont'd)

Projectiles (Chapter 6)

Explore the parametric equations for the path of the particle and their Cartesian form, both algebraically and graphically. (Page 120)
• GeoGebra interactive

Application of forces (Chapter 7)

Explore the forces in a ladder problem in a more detailed diagram. (Page 143)
• GeoGebra interactive

Further kinematics (Chapter 8)

Explore the solution to a further kinematics problem. (Page 160)
• GeoGebra interactive

Explore the solution to a skater further kinematics problem. (Page 162)
• GeoGebra interactive