

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

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](#)

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)

- [GeoGebra interactive](#)

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 $y = \frac{\sqrt{a}}{x}$ 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](#)

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](#)

Trigonometric identities and equations (Chapter 10)

Explore the values of $\sin \theta$, $\cos \theta$ and $\tan \theta$ 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](#)

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 content

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 content

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 content

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](#)

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 $\sin \theta$, $\cos \theta$ and $\tan \theta$ 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](#)

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 $y = \frac{\sin x}{e^{2x}}$. (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)

- [GeoGebra interactive](#)

Locate the root of $f(x) = \ln x - 1/x$. (Page 276)

- [GeoGebra interactive](#)

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 y , 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 content

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 content**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](#)

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](#)