

HIGHER GCSE UNIT SUMMARY: UNIT 6: Real-life and algebraic linear graphs, quadratic and cubic graphs, the equation of a circle, plus rates of change and area under graphs made from straight lines

6a) Graphs: the basics and real-life graphs

Unit Description	Taught	Revision Priority
Identify and plot points in all four quadrants;		
Draw and interpret straight-line graphs for real-life situations, including ready reckoner graphs, conversion graphs, fuel bills, fixed charge and cost per item;		
Draw distance–time and velocity–time graphs;		
Use graphs to calculate various measures (of individual sections), including: unit price (gradient), average speed, distance, time, acceleration; including using enclosed areas by counting squares or using areas of trapezia, rectangles and triangles;		
Find the coordinates of the midpoint of a line segment with a diagram given and coordinates;		
Find the coordinates of the midpoint of a line segment from coordinates;		
Calculate the length of a line segment given the coordinates of the end points;		
Find the coordinates of points identified by geometrical information.		
Find the equation of the line through two given points.		

6b) Linear graphs and coordinate geometry

Unit Description	Taught	Revision Priority
Plot and draw graphs of $y = a$, $x = a$, $y = x$ and $y = -x$, drawing and recognising lines parallel to axes, plus $y = x$ and $y = -x$;		
Identify and interpret the gradient of a line segment;		
Recognise that equations of the form $y = mx + c$ correspond to straight-line graphs in the coordinate plane;		
Identify and interpret the gradient and y -intercept of a linear graph given by equations of the form $y = mx + c$;		
Find the equation of a straight line from a graph in the form $y = mx + c$;		
Plot and draw graphs of straight lines of the form $y = mx + c$ with and without a table of values;		
Sketch a graph of a linear function, using the gradient and y -intercept (i.e. without a table of values);		
Find the equation of the line through one point with a given gradient;		
Identify and interpret gradient from an equation $ax + by = c$;		
Find the equation of a straight line from a graph in the form $ax + by = c$;		
Plot and draw graphs of straight lines in the form $ax + by = c$;		
Interpret and analyse information presented in a range of linear graphs: use gradients to interpret how one variable changes in relation to another; find approximate solutions to a linear equation from a graph; identify direct proportion from a graph; find the equation of a line of best fit (scatter graphs) to model the relationship between quantities;		
Explore the gradients of parallel lines and lines perpendicular to each other;		
Interpret and analyse a straight-line graph and generate equations of lines parallel and perpendicular to the given line;		
Select and use the fact that when $y = mx + c$ is the equation of a straight line, then the gradient of a line parallel to it will have a gradient of m and a line perpendicular to this line will have a gradient of $-\frac{1}{m}$.		

6c) Quadratic, cubic and other graphs

Unit Description	Taught	Revision Priority
Recognise a linear, quadratic, cubic, reciprocal and circle graph from its shape;		
Generate points and plot graphs of simple quadratic functions, then more general quadratic functions;		
Find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function;		
Interpret graphs of quadratic functions from real-life problems;		
Draw graphs of simple cubic functions using tables of values;		
Interpret graphs of simple cubic functions, including finding solutions to cubic equations;		
Draw graphs of the reciprocal function $y = \frac{1}{x}$ with $x \neq 0$ using tables of values;		
Draw circles, centre the origin, equation $x^2 + y^2 = r^2$.		