



Essential Knowledge		Teaching Points	
<ul style="list-style-type: none"> Define a 'quadratic' expression; Multiply together two algebraic expressions with brackets; Square a linear expression, e.g. $(x + 1)^2$; Factorise quadratic expressions of the form $x^2 + bx + c$; Factorise a quadratic expression $x^2 - a^2$ using the difference of two squares; Solve quadratic equations by factorising; Find the roots of a quadratic function algebraically. Generate points and plot graphs of simple quadratic functions, then more general quadratic functions; Identify the line of symmetry of a quadratic graph; Find approximate solutions to quadratic equations using a graph; Interpret graphs of quadratic functions from real-life problems; Identify and interpret roots, intercepts and turning points of quadratic graphs. 		<ul style="list-style-type: none"> This unit can be extended by including quadratics where $a \neq 1$. Emphasise the fact that x^2 and x are different 'types' of term – illustrate this with numbers The graphs should be drawn freehand and in pencil, joining points using a smooth curve. Encourage efficient use of the calculator. Extension work can be through plotting cubic and reciprocal graphs, solving simultaneous equations graphically 	
Assumed Prior Knowledge/ Links / Interleaving			
<ul style="list-style-type: none"> Students should be able to square negative numbers. Students should be able to substitute into formulae. Students should be able to plot points on a coordinate grid. Students should be able to expand single brackets and collect 'like' terms 			
Potential Barriers to Access / Misconceptions		Opportunities for Reasoning/Problem Solving/Proofs	
<ul style="list-style-type: none"> x terms can sometimes be 'collected' with x^2. Squaring negative numbers can be a problem Some students find difference of two squares hard to recognise Students usually mix the y and x axes up when explaining lines of reflection 		<ul style="list-style-type: none"> Visual proof of the difference of two squares Match graphs with their respective functions 	
Key Mathematical Vocabulary	Quadratic, function, solve, expand, factorise, simplify, expression, graph, curve, factor, coefficient, bracket		