Mathematics Faculty Overview

Year 9

HARROW HIGH SCHOOL

"Our curriculum is designed to help students truly master mathematics, so they can apply their skills in unfamiliar situations whenever needed. Topics from the same content areas have been grouped together to form mastery half terms. More time is spent teaching fundamentals to avoid reteaching in later years."

Autumn 2: Quadratics

Skills

- Simplify and rearrange expressions with quadratic terms
- Expand the product of two binomials (double brackets)
- Complete the square of a simple quadratic expression
- Factorise quadratic expressions into brackets, including the difference of two squares
- Plot the graphs of quadratic functions
- Solve a simple quadratic equation by making x the subject
- Form and solve quadratic equations in context
- Solve quadratic equations by factorising and completing the square
- Sketch a quadratic graph
- Identify the vertex, intercepts and line of symmetry of a quadratic graph
- Solve a quadratic equation using its graph

Knowledge

- Generalise distributivity and begin to understand the fundamental ideas of the binomial expansion (triple brackets etc.)
- Recognise and describe linear and non-linear graphs
- Identify and manipulate quadratic expressions
- Know the form and parabolic graph of a quadratic function, and recognise the significance of the turning point and intercepts
- Reason with the symmetry of a quadratic graph
- Know and use the zero product rule to solve quadratic equations by factorising (adfected quadratic equations)
- Know that in general a quadratic equation can have 0, 1 or 2 solutions
- Recognise that the intercept or point of intersection on a quadratic graph represents a solution

Rationale

Building on algebra from years 7 and 8, learners dedicate one half term to studying the features of quadratic expressions, equations and functions. This topic is a foundational topic in KS4 and KS5 mathematics. Time is spent throughout considering why modelling with a quadratic function may be useful.

The module begins by examining quadratic expressions and how they are represented on a graph. The graph is then used to aid learners reason about the behaviour of a quadratic function. Learners spend time learning how to manipulate quadratics using representations such as algebra tiles.

Next, learners consider how to find solutions to quadratic equations, beginning with simple types that can be solved by rearranging. The graph is used to help learners interpret the meaning of a solution and link it to prior learning about equations. The module ends with factorising, solving and sketching quadratics.