Year 11 Maths Learning Journey

Autumn Term 4 – Expanding and Factorising

Core knowledge	Reference
Single bracket (R) "Is it possible to have three or more terms inside a bracket?"	Worksheet
Expand binomials (R) "Why can you simplify some quadratic expressions to three or fewer terms, but not others?"	Worksheet
Factorise quadratic expressions "How can algebra tiles be used to show the a quadratic expression only has two factors"	Worksheet
Complex quadratic expressions (H) "Why is it efficient to start with the tiles representing x^2 and ones when forming the rectangle?"	Worksheet
Solve equations equal to 0 "If two numbers/terms multiply to give 0, what do we know about one of the numbers/terms?"	Worksheet
Solve quadratics by factorization "What's the difference between factorizing and solving?"	Worksheet
Solve complex quadratics (H) "Why do we often use fractions rather than decimals when writing solutions?"	Worksheet
Completing the square (H) "Why is this method called completing the square? Can you model your answer?"	Worksheet
Using the quadratic formula "How do we know which number to substitute into the formula?"	Worksheet

Learning Checkpoints

LC Title	Completed	Dirt
Expanding and Factorising		

Key Vocabulary:

Binomial: an algebraic expression of the sum or the difference of two terms.

Bracket: Symbols used to group numbers in arithmetic or letters and numbers in algebra and indicating certain operations as having priority.

Coefficient: A number used to multiply a variable.

Difference of two squares: Two terms that are squared and separated by a subtraction sign.

Expand: Multiply each term in the bracket by the expression outside the bracket.

Expression: A mathematical form expressed symbolically

Factor: When a number, or polynomial in algebra, can be expressed as the product of two numbers or polynomials, these are factors of the first.

Examples: 1, 2, 3, 4, 6 and 12 are all factors of 12 because $12 = 1 \times 12 = 2 \times 6 = 3 \times 4$:

Factorise: To express a number or a polynomial as the product of its factors.

Factorise fully: To put it in brackets by taking out the highest common factors.

Factorise: Finding what to multiply to get an expression

Formula: A fact, rule, or principle that is expressed in terms of mathematical symbols.

Highest Common Factor (HCF): The common factor of two or more numbers which has the highest value.

Identify: An equation that holds for all values of the variables. The symbol ≡ is used.

Multiply out: To expand a single bracket we multiply the term outside of the bracket by everything inside of the bracket.

Product: The result of multiplying one number by another. Example: The product of 2 and 3 is 6 since $2 \times 3 = 6$.

Quadratic: Describing a expression of the form $ax2 + bx + c$ where a, b and c are real numbers.

Roots: Where a function equals zero.

Significant figures: The run of digits in a number that are needed to specify the number to a required degree of accuracy.

Simplify: Reducing the expression/fraction/problem in a simpler form.

Solutions: A value or values which, when substituted for a variable in an equation, make the equation true.

Solve: To find a solution.

Substitute: Numbers can be substituted into an algebraic expression in x to get a value for that expression for a given value of x.

Surd: An irrational number expressed as the root of a natural number.

Term: A single mathematical expression.

Trial and improvement: This method involves substituting the unknown with different values, until we find one that works.