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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Algebra** |
| 1. Expression | A mathematical statement written using **symbols**, **numbers** or **letters**, | 3x + 2 or 5y2 |
| 2. Equation | A statement showing that **two expressions are equal** | 2y – 17 = 15 |
| 3. Identity | An equation that is **true for all values** of the variables  An identity uses the symbol: | *2x ≡ x+x* |
| 4. Formula | Shows the **relationship** between **two or more variables** | Area of a rectangle = length x width or A= LxW |
| 5. Simplifying Expressions | **Collect ‘like terms’.**  Be careful with negatives.  and are not like terms. |  |
| 6. times | The answer is not . | Squaring is multiplying by itself, not by 2. |
| 7. | The answer is not | If p=2, then =2x2x2=8, not 2x3=6 |
| 8. | The answer is 3p not | If p=2, then 2+2+2=6, not |
| 9. Expand | To expand a bracket, **multiply** each term **in the bracket** by the expression **outside** the bracket. |  |
| 10. Factorise | The **reverse** of **expanding**.  Factorising is writing an expression as a product of terms by ‘**taking out’ a common factor**. | , where 3 is the common factor. |

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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Solving Quadratics by Factorising** |
| 1. Quadratic | A quadratic expression is of the form  where and are numbers, | Examples of quadratic expressions:  Examples of non-quadratic expressions: |
| 2. Factorising Quadratics | When a quadratic expression is in the form find the two numbers that **add to give b** and **multiply to give c**. | (because 5 and 2 add to give 7 and multiply to give 10)  (because +4 and -2 add to give +2 and multiply to give -8) |
| 3. Difference of Two Squares | An expression of the form can be factorised to give |  |
| 4. Solving Quadratics | Isolate the term and square root both sides.  Remember there will be a **positive and a negative solution**. |  |
| 5. Solving Quadratics | **Factorise** and then **solve = 0**. |  |
| 6. Solving Quadratics by Factorising | **Factorise** the quadratic in the usual way.  **Solve = 0**  Make sure the equation = 0 before factorising. | Solve  Factorise: |

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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Simultaneous Equations** |
| 1. Simultaneous Equations | A set of **two or more equations**, each involving **two or more variables** (letters).  The **solutions** to simultaneous equations **satisfy both**/all of the **equations**. |  |
| 2. Variable | A **symbol**, usually a **letter**, which **represents a number** which is usually unknown. | In the equation , is the variable. |
| 3. Coefficient | A **number** used to **multiply** a **variable**.  It is the number that comes before/in front of a letter. | 6z  6 is the coefficient  z is the variable |
| 4. Solving Simultaneous Equations (by Elimination) | 1. **Balance** the **coefficients** of one of the variables.  2. **Eliminate** this variable by adding or subtracting the equations (**Same Sign Subtract, Different Sign Add**)  3. **Solve** the linear equation you get using the other variable.  4. **Substitute** the value you found back into one of the previous equations.  5. **Solve** the equation you get.  6. **Check** that the two values you get satisfy both of the original equations. | Multiply the first equation by 2.  Same Sign Subtract (+10x on both)  Substitute in to equation.  Solution: |
| 5. Solving Simultaneous Equations (by Substitution) | 1. **Rearrange** one of the equations into the form or  2. **Substitute** the right-hand side of the rearranged equation into the other equation.  3. Expand and **solve** this equation.  4. **Substitute** the value into the or equation.  5.  **Check** that the two values you get satisfy both of the original equations. | Rearrange:  Substitute:  Solve:  Substitute:  Solution: |
| 6. Solving Simultaneous Equations  (Graphically) | **Draw the graphs** of the two equations.  The **solutions** will be **where the lines meet**.  The solution can be written as a **coordinate**. | and  They meet at the point with coordinates (2,3) so the answer is and |

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| **Topic/Skill** | **Definition/Tips**  **Topic: Proofs** | **Example** |
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| 3. Identity | An equation that is **true for all values** of the variables  An identity uses the symbol: | *2x ≡ x+x* |
| 4. Formula | Shows the **relationship** between **two or more variables** | Area of a rectangle = length x width or A= LxW |
| 5. Coefficient | A **number** used to **multiply** a **variable**.  It is the number that comes before/in front of a letter. | 6z  6 is the coefficient  z is the variable |
| 6. Odds and Evens | An **even** number is a **multiple of 2**  An **odd** number is an integer which is **not a multiple of 2**. | If n is an integer (whole number):  An even number can be represented by **2n** or **2m** etc.  An odd number can be represented by **2n-1** or **2n+1** or **2m+1** etc. |
| 7. Consecutive Integers | Whole numbers that follow each other in order. | If n is an integer:  **n, n+1, n+2** etc. are consecutive integers. |
| 8. Square Terms | A term that is produced by multiply another term by itself. | If n is an integer:  , etc. are square integers |
| 9. Sum | The sum of two or more numbers is the value you get when you add them together. | The sum of 4 and 6 is 10 |
| 10. Product | The product of two or more numbers is the value you get when you multiply them together. | The product of 4 and 6 is 24 |
| 11. Multiple | To show that an expression is a **multiple** of a number, you need to show that you can **factor out the number**. | is a multiple of 4 because it can be written as: |

**Knowledge Organiser**