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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 variablesAn 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. $x^{2}$ and $x$ are not like terms. | $$2x+3y+4x-5y+3=6x-2y+3$$$$3x+4-x^{2}+2x-1=5x-x^{2}+3$$ |
| 6. $x $times $x$ | The answer is $x^{2}$ not $2x$. | Squaring is multiplying by itself, not by 2. |
| 7. $p×p×p$  | The answer is $p^{3}$ not $3p$ | If p=2, then $p^{3}$=2x2x2=8, not 2x3=6 |
| 8. $p+p+p$  | The answer is 3p not $p^{3}$ | If p=2, then 2+2+2=6, not $2^{3}=8$ |
| 9. Expand | To expand a bracket, **multiply** each term **in the bracket** by the expression **outside** the bracket. | $$3\left(m+7\right)=3x+21$$ |
| 10. Factorise | The **reverse** of **expanding**.Factorising is writing an expression as a product of terms by ‘**taking out’ a common factor**. | $6x-15=3(2x-5)$, where 3 is the common factor. |

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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Equations and Formulae**  |
| 1. Solve | To find the **answer**/value of something**Use inverse operations** on both sides of the equation (balancing method) until you find the value for the letter. | Solve $2x-3=7$Add 3 on both sides$$2x=10$$Divide by 2 on both sides$$x=5$$ |
| 2. Inverse | **Opposite** | The inverse of addition is subtraction.The inverse of multiplication is division. |
| 3. Rearranging Formulae | **Use inverse operations** on both sides of the formula (balancing method) until you find the expression for the letter. | Make x the subject of $y=\frac{2x-1}{z}$Multiply both sides by z$$yz=2x-1$$Add 1 to both sides$$yz+1=2x$$Divide by 2 on both sides$$\frac{yz+1}{2}=x$$We now have x as the subject. |
| 4. Writing Formulae | **Substitute letters for words** in the question. | Bob charges £3 per window and a £5 call out charge.$$C=3N+5$$Where N=number of windows and C=cost |
| 5. Substitution | **Replace letters with numbers**.Be careful of $5x^{2}$. You need to square first, then multiply by 5. | $a=3, b=2 and c=5.$ Find:1. $2a=2×3=6$ 2. $3a-2b=3×3-2×2=5$3. $7b^{2}-5=7×2^{2}-5=23$ |

**Knowledge Organiser**