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| **Topic/Skill**  | **Definition/Tips** | **Example** |
| 1. Expression | A mathematical statement written using **symbols**, **numbers** or **letters**, | $$3x + 2 or 5y^{2}$$ |
| 2. Equation | A statement showing that **two expressions are equal** | $$2y – 17 = 15$$ |
| 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 $p^{3}$=$2×2×2=8$, not $2×3=6$ |
| 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. Expanding Double Brackets  | To multiply out a pair of double brackets, **multiply** each term **in the first brackets** by each term in the **second** **brackets**. | $$p^{2}+2p-8$$ |
| 11. Expanding Triple Brackets  | To multiply out triple brackets, **multiply** each term **in the first brackets** by each term in the **second** **brackets**. Then **multiply** this **answer** by each term in the **third brackets.** |  |
| 12. Factorise | The **reverse** of **expanding**.Factorising is writing an expression as a product of terms by ‘**taking out’ a common factor** or **highest common factor** | $6x-15=3(2x-5)$, where 3 is the common factor.$3x^{2}y^{2}+9xy=3xy(xy+3)$, where $3xy$ is the highest common factor. |
| 13. 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$$x=5$$ |
| 14. Writing Formulae and Equations | **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 |
| 15. Quadratic | A quadratic expression is of the form$$ax^{2}+bx+c$$where $a, b$ and $c$ are numbers, $a\ne 0$ | Examples of quadratic expressions:$$x^{2}$$$$8x^{2}-3x+7$$Examples of non-quadratic expressions:$$2x^{3}-5x^{2}$$$$9x-1$$ |
| 16. Factorising Quadratics | When a quadratic expression is in the form $x^{2}+bx+c$ find the two numbers that **add to give b** and **multiply to give c**. | $$x^{2}+7x+10=(x+5)(x+2)$$(because 5 and 2 add to give 7 and multiply to give 10)$$x^{2}+2x-8=(x+4)(x-2)$$(because +4 and -2 add to give +2 and multiply to give -8) |
| 17. Factorising Quadratics when $a\ne 1$ | When a quadratic is in the form$$ax^{2}+bx+c$$1. Multiply a by c = ac2. Find two numbers that add to give b and multiply to give ac.3. Re-write the quadratic, replacing $bx$ with the two numbers you found.4. Factorise in pairs – you should get the same bracket twice5. Write your two brackets – one will be the repeated bracket, the other will be made of the factors outside each of the two brackets. | Factorise $6x^{2}+5x-4$1. $6×-4=-24$2. Two numbers that add to give +5 and multiply to give -24 are +8 and -33. $6x^{2}+8x-3x-4$4. Factorise in pairs: $$2x\left(3x+4\right)-1(3x+4)$$5. Answer = $(3x+4)(2x-1)$ |