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| **Topic/Skill** | **Definition/Tips** | **Example**  **Topic: Further Quadratics** |
| 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: |
| 7. Quadratic Graph | A ‘**U-shaped**’ curve called a **parabola**.  The equation is of the form  , where , and are numbers, .  If **,** the parabola is **upside down**. | Image result for quadratic graph definition math |
| 8. Roots of a Quadratic | A root is a **solution**.  The roots of a quadratic are the **-intercepts of the quadratic graph**. | Image result |
| 9. Turning Point of a Quadratic | A turning point is the **point where a quadratic turns**.  On a **positive parabola**, the turning point is called a **minimum**.  On a **negative parabola**, the turning point is called a **maximum**. | Minimum turning pointMaximum turning point |
| 10. Factorising Quadratics when | When a quadratic is in the form  1. Multiply a by c = ac  2. Find two numbers that add to give b and multiply to give ac.  3. Re-write the quadratic, replacing with the two numbers you found.  4. Factorise in pairs – you should get the same bracket twice  5. 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  1.  2. Two numbers that add to give +5 and multiply to give -24 are +8 and -3  3.  4. Factorise in pairs:  5. Answer = |
| 11. Solving Quadratics by Factorising | **Factorise** the quadratic in the usual way.  **Solve = 0**  Make sure the equation = 0 before factorising. | Solve  Factorise: |
| 12. Completing the Square (when | A quadratic in the form can be written in the form  1. Write a set of brackets with in and **half** the value of  2. Square the bracket.  3. Subtract and add  4. Simplify the expression.  You can **use the completing the square form** to help **find the maximum or minimum** of quadratic graph. | Complete the square of  Answer:  The minimum value of this expression occurs when , which occurs when  When ,  Minimum point = |
| 13. Completing the Square (when | A quadratic in the form can be written in the form **p**  Use the same method as above, but factorise out at the start. | Complete the square of  Answer: |
| 14. Solving Quadratics by Completing the Square | **Complete the square** in the usual way and **use inverse operations to solve**. | Solve  Answer: |
| 15. Solving Quadratics using the Quadratic Formula | A quadratic in the form can be solved using the formula:  Use the formula if the quadratic does not factorise easily. | Solve  Answer: |

**Knowledge Organiser**