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| **Topic/Skill**  | **Definition/Tips** | **Example****Topic: Solving Quadratics by Factorising**  |
| 1. 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:$$2x^{3}-5x^{2}$$$$9x-1$$ |
| 2. 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) |
| 3. Difference of Two Squares | An expression of the form $a^{2}-b^{2}$ can be factorised to give $(a+b)(a-b)$ | $$x^{2}-25=(x+5)(x-5)$$$$16x^{2}-81=(4x+9)(4x-9)$$ |
| 4. Solving Quadratics $(ax^{2}=b)$ | Isolate the $x^{2}$ term and square root both sides.Remember there will be a **positive and a negative solution**. | $$2x^{2}=98$$$$x^{2}=49$$$$x=\pm 7$$ |
| 5. Solving Quadratics $(ax^{2}+bx=0)$ | **Factorise** and then **solve = 0**. | $$x^{2}-3x=0$$$$x\left(x-3\right)=0$$$$x=0 or x=3$$ |
| 6. Solving Quadratics by Factorising $\left(a=1\right)$  | **Factorise** the quadratic in the usual way.**Solve = 0** Make sure the equation = 0 before factorising. | Solve $x^{2}+3x-10=0$Factorise: $\left(x+5\right)\left(x-2\right)=0$$$x=-5 or x=2$$ |
| 7. 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 = $(3x+4)(2x-1)$ |
| 8. Solving Quadratics by Factorising $\left(a\ne 1\right)$  | **Factorise** the quadratic in the usual way.**Solve = 0** Make sure the equation = 0 before factorising. | Solve $2x^{2}+7x-4=0$Factorise: $\left(2x-1\right)\left(x+4\right)=0$$$x=\frac{1}{2} or x=-4$$ |

**Knowledge Organiser**